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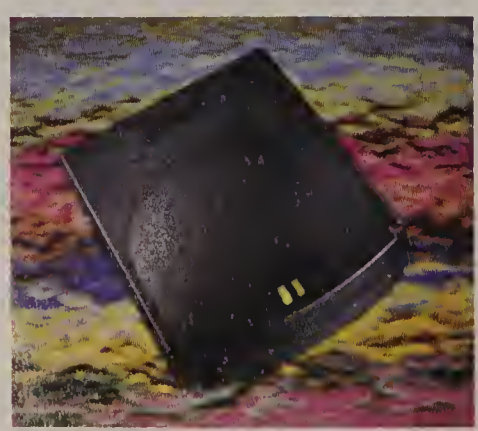

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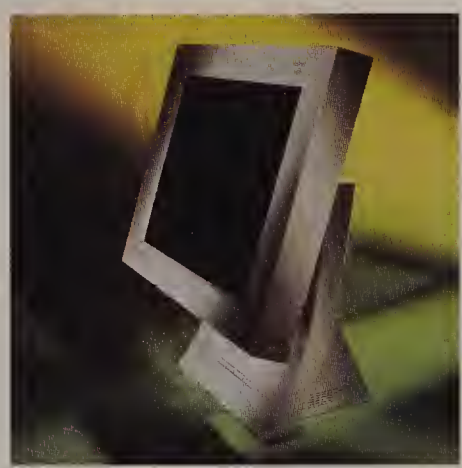

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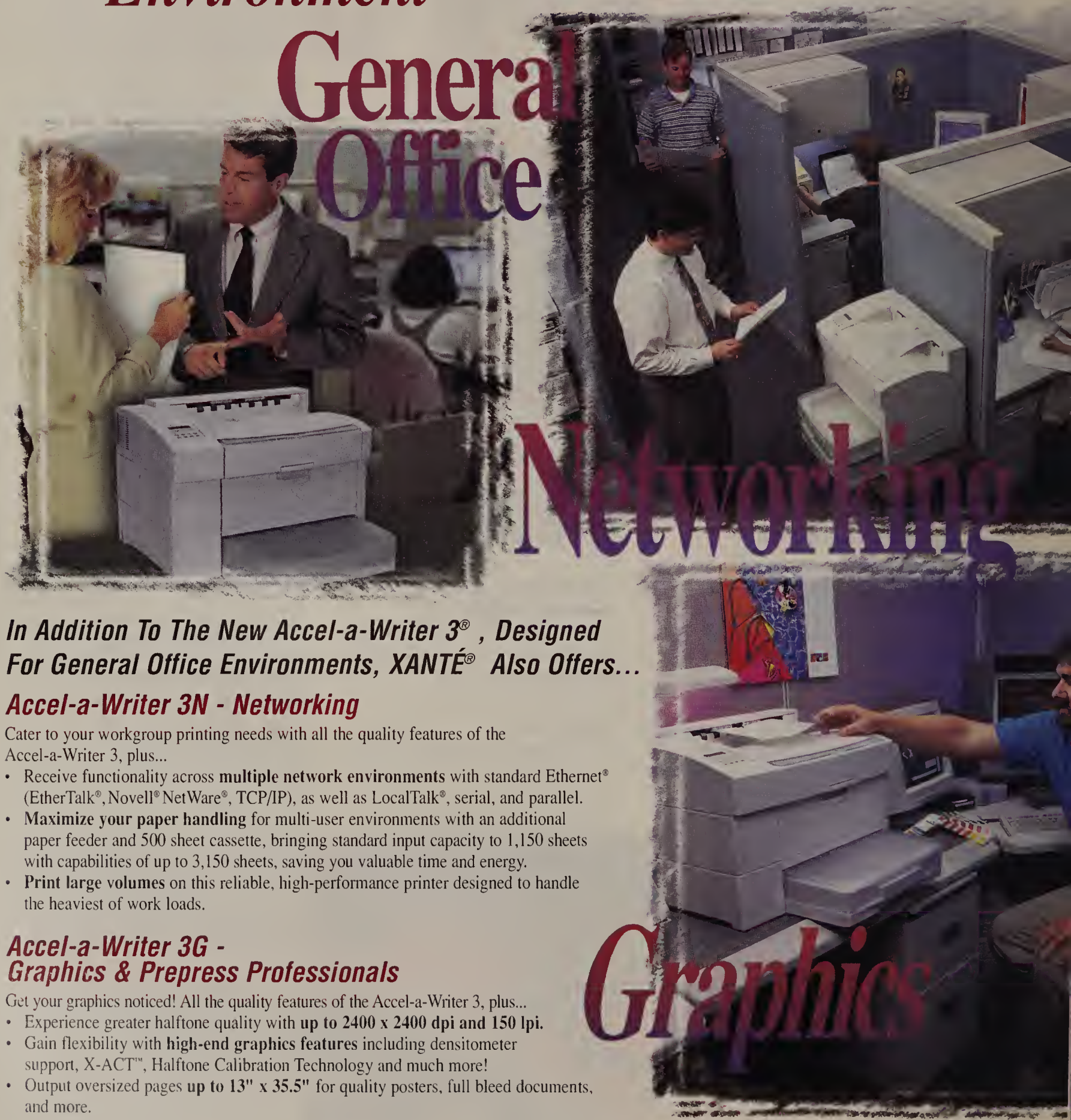

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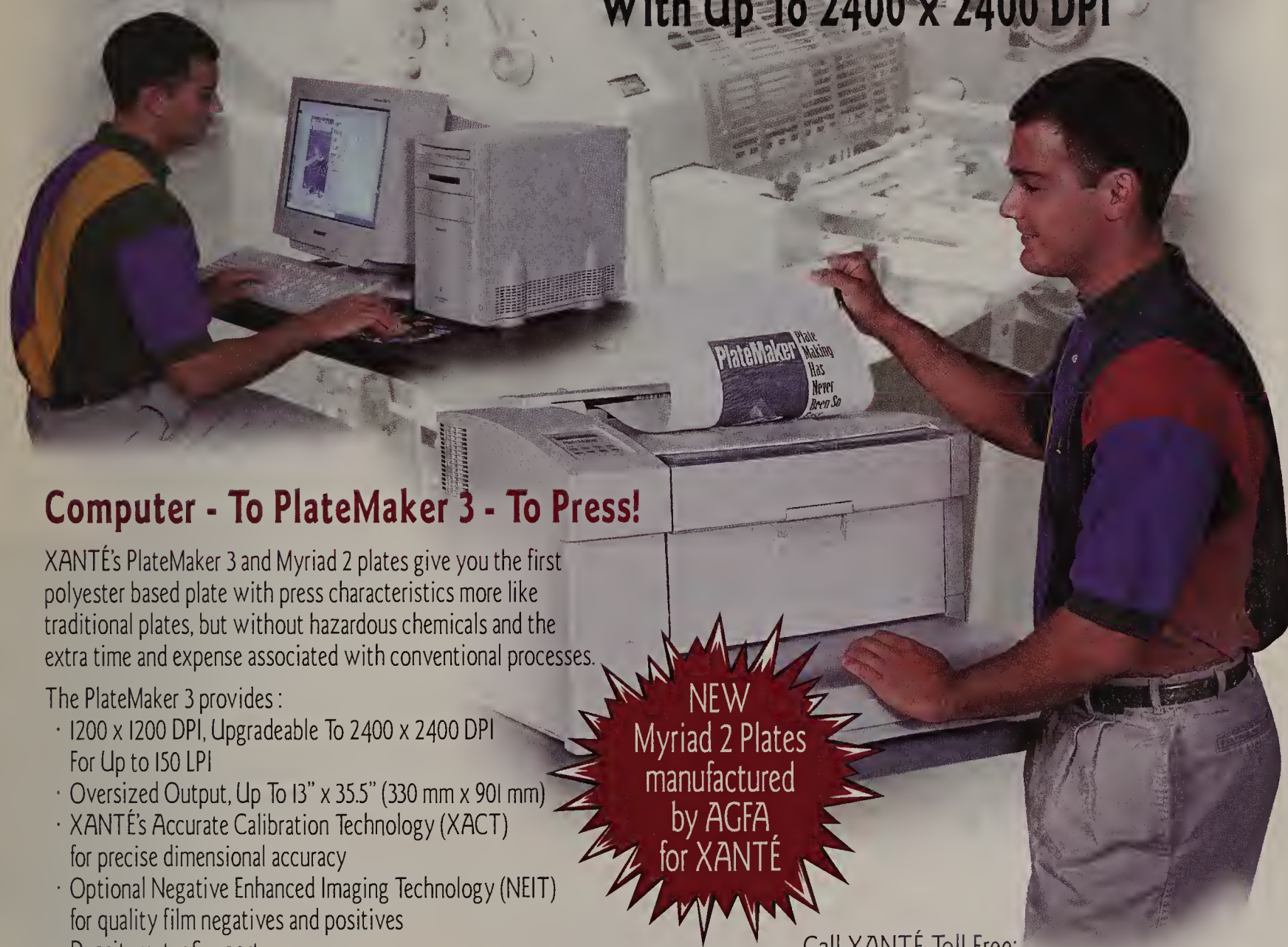

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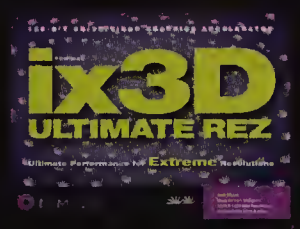

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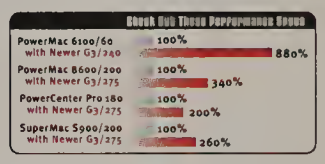

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JULY 1998

Letters

Mixed Feelings about Cross-Platform Coverage

WHY ARE YOU RUNNING ARTICLES about Windows and Intel machines? This isn't why I subscribed to *Macworld*. I'm not some Microsoft-despising freak, but I love my Mac and read *Macworld* to learn of news about the Macintosh platform. If I ever need info about a Wintel machine, I will buy one of those magazines.

IAN WALTER
Laguna, California

JUST READ THE ARTICLES ON living with Windows (April 1998)—great stuff ! I now work in an office with three PC users; my colleagues may be able to scroll a huge spreadsheet in milliseconds, but they come to me if they want something scanned, rescaled, placed on a transparent background, or saved in a different format. We have a network with a Windows NT server, and all share a Hewlett-Packard LaserJet 5. I also have SoftWindows 95, which is extremely slow even on a Power Mac 7300/200.

I think Apple could strike a killer blow if it offered hardware integration via a PC-compatibility card in every new Mac. This will seem like heresy to hardened Mac addicts, but I'm one too!

BILL DADY
Caterham, Surrey, England

YOUR APRIL ISSUE WAS THOROUGHLY depressing. I don't need you to remind me of how pervasive those Windows 95 and NT platforms are by devoting a whole issue to how I may accommodate them in my computing life. Having to deal with these boring boxes every day at work is bad enough. What I want to hear is how we're all going to move the Mac platform back into the mainstream. And I want *Macworld* to be

pushing toward this end, not pulling me over to the competition. I can subscribe to a PC magazine for that.

BOB GRIFFITH
Mesa, Arizona

I REALLY APPRECIATE YOUR COVERage of Mac-and-PC compatibility issues in the April issue of *Macworld*. It's good to see that you are on top of the most pressing issues facing Macintosh users in an increasingly PC-dominated world.

CHRIS SOTOMAYOR
Brooklyn, New York

Save My Mac!

BRAVO ON THE "CROSS-PLATFORM Essentials" series of articles in your April 1998 issue! It's very difficult to get accurate information that relates to real-world computer networks. I'd like to add to Henry Bortman's information ("Save Your Mac!"): there *is* a built-in feature of Windows NT Server 4.0 that allows Macintosh creator codes with Windows programs. This feature allows Windows clients to double-click on a Macintosh-created file and have it opened by the appropriate Windows application.

However, Macintosh files still appear as generic file icons to Windows users. The way around that, of course, is to request that Macintosh users use DOS extensions—not a pretty sight.

KENT B. HETHERWICK
Berkeley, California

WHILE HENRY BORTMAN'S ARTIcle gives good tips for coexisting in a corporate Windows world, many of us Mac users will never have this option. What we need are good Total Cost of Ownership (TCO) arguments that will enable us to keep our Macs in the first place. What are the support costs of a Windows NT population versus those of a Mac population?

It's been a profound disappointment for those of us in mixed-platform environments that *Macworld*, the EvangeList mailing list, and Apple itself have not helped us with well-documented TCO ammunition over the last several years.

It would have been so much help if *Macworld* had taken up the TCO argument, rather than providing last-ditch advice about file swapping with Windows 95.

ADELE FRAMER
San Francisco, California

Reconsider PC-Compatibility Cards

I READ YOUR ARTICLE SLAMMING PC-compatibility cards, and I think they are worth a second look ("Can the Mac Really Do Windows?" April 1998). PC cards are a good value if you consid-

continues

JEFF NEUMANN

CORRECTIONS

- *Disks formatted with HFS+ can't be selected as virtual-memory disks on 680X0 machines, but they can on any PowerPC-based machine* (Secrets, *April 1998).*
- *NetUSA's Mac-in-DOS Plus 2.0 supports CD-ROMs and SCSI devices ("Mac Life Preservers," April 1998).*

er the cost of a new monitor, Ethernet card, file-sharing software, removable-storage drives, and other accessories needed to make that bargain PC a fully functional and productive workstation. This is especially true for graphic artists, publishers, or anyone who has a significant investment in large monitors and peripherals.

Having used PC-compatibility cards for many years, I find the ability to switch back and forth between the Mac and Windows on my main screen a great productivity booster. You can also switch between Windows 95, NT, or 3.1; DOS; or separate versions of the same OS quite easily by having separate volumes set up for each.

KEITH GRANGER
San Rafael, California

Intergraph ExtremeZ

I MUST ADMIT, I WAS SHOCKED AT first to see how competitively you ranked the Intergraph ExtremeZ 2D system when compared with the Macs in your article "Publishing Power Play" (April 1998). My shock came because you seemingly neglected to make a point of the Intergraph's much-superior hardware. You made a glaring mistake in your analysis by mentioning only in passing that the Intergraph is equipped with not one but *two* 300MHz Pentium II CPUs.

But the fact that all of the Mac systems were able to maintain a margin of performance close to that of the Intergraph system, despite its dual processors, only serves to indicate the Mac's superiority in the field of publishing. And of course this is only in addition to the Mac's ease of use and intuitive OS. Add this to the fact that comparably equipped, single-processor Mac systems cost about $2,000 less, and you are left with an unappealing, overpriced (oh, did I forget to mention ugly?) Windows NT–running doorstop.

JOHN ANGELINI
Middletown, Connecticut

We compared the Intergraph system with the fastest Macs we could find and matched the computers not only in terms of video and RAM but also the hard-disk subsystem. While we would've liked to have tested the dual-processor Intergraph system against a dual-processor G3 system from Apple, that beast doesn't exist, and probably never will.

Fundamentally, though, the number of processors inside a box doesn't matter—what does is how fast the computer is and how much it costs. As we showed, the Intergraph system is somewhat faster and more expensive. And although Intergraph did a heroic job of making it reasonably easy to integrate the ExtremeZ 2D into a Mac environment, all that impressive hardware doesn't change two facts: the ExtremeZ is expensive, and it doesn't run the Mac OS.—Bruce Fraser and Ed.

IN REVIEWING THE INTERGRAPH ExtremeZ workstation, the author missed a major drawback that clearly benefits the Mac: dual monitor setup. If a user wanted to hook up dual monitors to the ExtremeZ workstation, a minimum of $1,999 would be needed for Intergraph's "second monitor option." Prices go up from there. Even then, how well would NT handle such a setup? On Macs, even cheap, $150 cards could do the trick.

DEVIN COMISKEY
Wilton, Connecticut

TaxCut Doesn't Cut It

I RECENTLY PURCHASED KIPLINGER TaxCut (about an hour before I received my copy of *Macworld* that said MacInTax was better) and got a rude surprise when I opened the box (*Reviews*, April 1998). The box was labeled "For Win/Win 95 and Mac," but inside there was a little yellow card that said, "Attention Macintosh Users! The Macintosh version of Kiplinger TaxCut for the 1997 tax year is not included on the enclosed CD-ROM. We apologize for any inconvenience this may cause, but we will release the Macintosh software as soon as possible. We expect to have it finished before January 1, 1998."

I can't believe Block Financial can get away with this! Imagine buying a plane ticket and getting a slip of paper that says, "Sorry for the inconvenience, but we don't actually have a plane. We'll let you know when we get around to buying one."

After a phone call, the "update" (that is, the product I already paid for) was in the mail. I wonder how many people opened their TaxCut on April 14 only to find out they couldn't file in time.

CHRIS SWETT
Monterey, California

56 Kbps? Not So Fast.

YOUR APRIL 1998 ARTICLE "THE Modem Showdown," regarding 56K modems, leaves out one important problem that, more than any other factor, limits the modems' speed: the phone line to the central office and the central-office switching equipment. I have a Global Village K56flex modem, and the fastest I am able to access the phone line is 44 Kbps, and that is rare. Ninety percent of the time it allows me only 33.6 Kbps, and occasionally only 28.8 Kbps, even though I am using a 56-Kbps phone number supplied by my ISP. Until the local phone companies clear the noise from their lines, 56K modems are a waste of money.

FRANK NANKIN
Miami, Florida

Saving Money Online

I READ "THE CHEAPSKATE'S GUIDE to the Web" and was surprised that David Pogue had not found the deal-mac Web site, www.deal-mac.com (*The Desktop Critic*, April 1998). I searched the ComputerESP site for TechWorks' Power3D card, and the best price was $196; deal-mac's price was $179. deal-mac is specifically for Mac owners, which is another reason why I like it.

R. MOLLOT
Edmonton, Alberta, Canada

Letters should be sent to *Letters*, Macworld, 301 Howard St., 16th Fl., San Francisco, CA 94105; via fax, 415/442-0766; or electronically via CompuServe (70370,702), MCI Mail (294-8078), AppleLink (Macworld1), or the Internet (letters@macworld.com). Include a return address and daytime phone number. Due to the high volume of mail received, we can't respond personally to each letter. We reserve the right to edit all letters. All published letters become the property of *Macworld*. m

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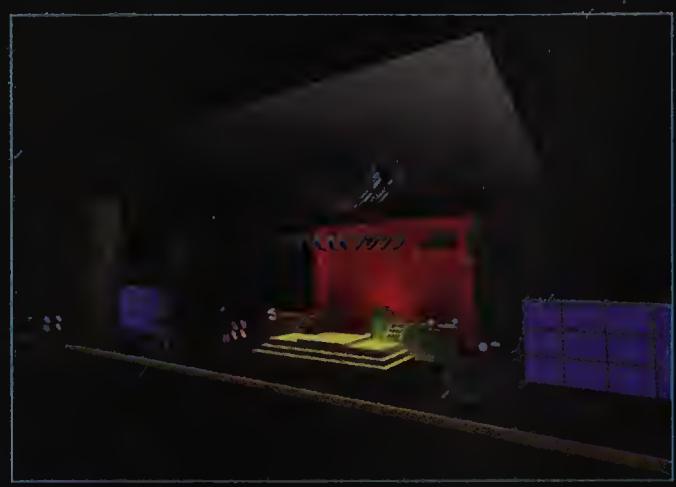

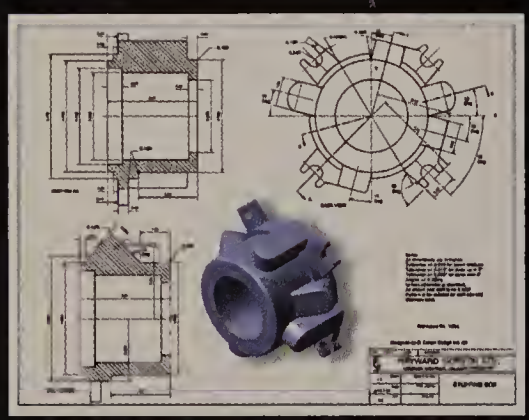

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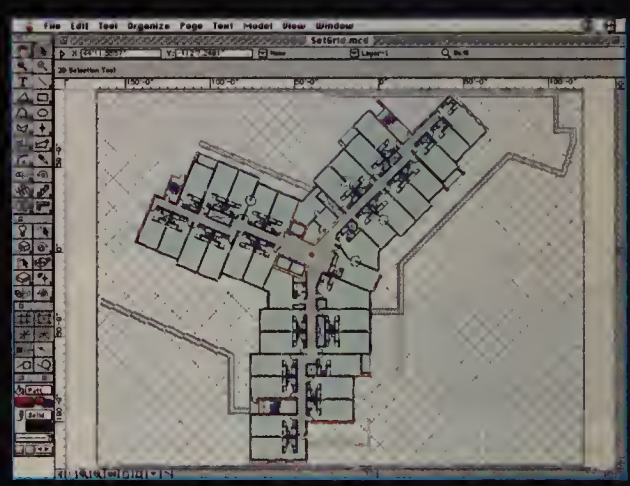

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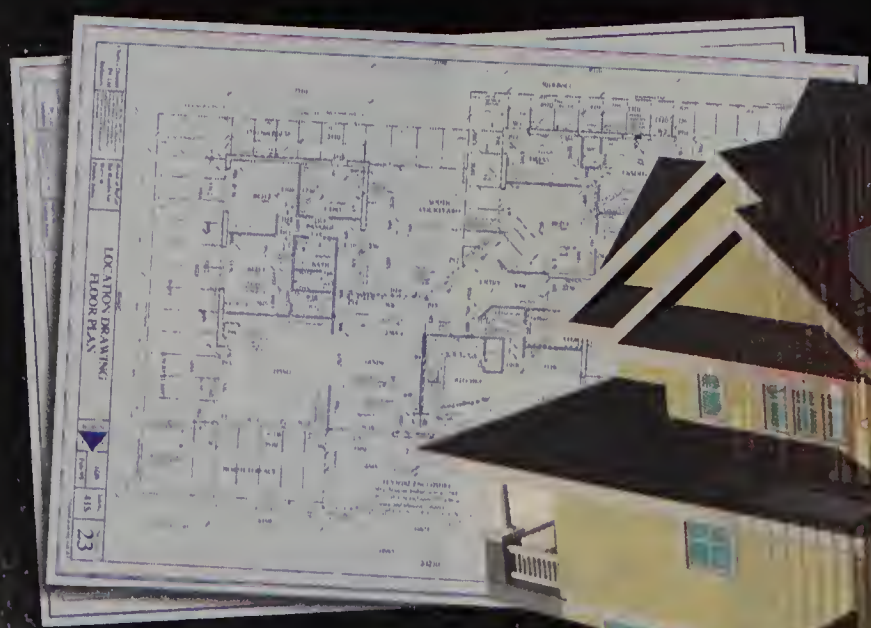

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The Vision Thing

by Andrew Gore

Defying Gravity . . . Again

THE iMAC IS THE MOST CONCRETE PROOF YET THAT APPLE IS ACTUALLY THINKING DIFFERENT

IN TECHNOLOGY, THERE ARE those seminal moments when things change—*really* change. The debut of the Macintosh on January 24, 1984, was one of those moments. Before that day, the computer world was all command lines and arcane abbreviations. Afterward, it was all icons and mice. Although few people really knew at the time just how big a change was coming, it was the original Macintosh more than any other product that fired the first shot of the personal-computing revolution.

It's far too soon to say if the introduction of the iMac on May 6, 1998, will prove to be another of those seminal moments in computing, but it certainly marks a major change for Apple. After years of Apple's panicked rushing to stay apace with an industry that was passing it by, the iMac puts Apple out ahead again. The reasons are simple: the iMac is innovative, elegant, inexpensive . . . and everyone's going to want one.

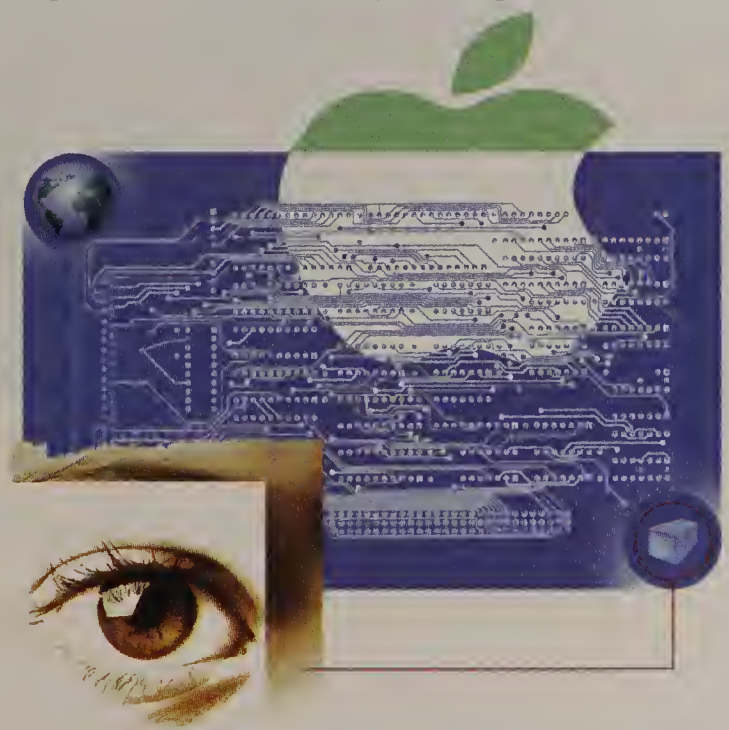
Hug It? Click It?

When I first saw the iMac—with Steve Jobs himself lifting the veil to reveal the amazing computer underneath—I couldn't help but think of Volkswagen's new Beetle. The parallels are striking. Just as the Beetle harkens back to its flower-powered ancestor, the iMac capitalizes on nostalgia for the all-in-one "classic" Mac of 1984.

But that's where the similarities between old and new end: The new Beetle is a wonder of nineties engineering, offering the latest bells and whistles with an incredibly functional, comfortable, and striking industrial design.

The iMac is also a technological wonder. For starters, it's the first Mac to sport the high-speed and easy-to-use Universal Serial Bus (USB). It also offers IrDA-compliant infrared networking, 100BaseT Ethernet, surround sound, a built-in modem, fast SDRAM, and a G3 processor. That's right—powering the iMac is a modern, speedy G3 processor (complete with backside cache), not some hobbled version of yesterday's chip technology. Steve Jobs put it best: "iMac is next year's computer for $1,299, not last year's computer for $999."

And technology aside, there's that striking industrial design: translucent plastics; easily accessible (but well-disguised) ports; and a more clever use of curves, angles, and varied textures than even the new Beetle can match. (The iMac, however, does lack the Beetle's built-in flower vase.) It's a strangely pleasing fusion of functionality, nostalgia (it



JOHN RITTER

even has a handle on top, just like its "luggable" progenitor), and edgy chic. So what if it looks a little like an alien chicken egg? It's one very *cool* alien chicken egg.

Then there's the way Apple is wrapping up this stylish package as an Internet-access terminal for real people. The Mac is synonymous with ease of use, and the Internet is not. With the iMac, Apple may finally be able to get consumers everywhere to make the connection between those two facts.

As has been discussed at some length in this column before (see "The Vision Thing," June 1998), one of the computer industry's consistently frustrating problems is that most of the people in the world who can afford a computer and are comfortable using one already own one.

That's not to say there aren't literally millions of potential new computer users out there, but computers will have to become significantly more compelling before those people will pony up the cash for one. And as Windows-based PC manufacturers learned last Christmas, a small price tag alone isn't compelling enough. With the iMac, Apple is attempting to combine the Mac's greater ease of use, prepackaged Internet access, a relatively low price, and a unique design to make those new customers take the plunge.

Truly Different

Steve Jobs says the iMac project started exactly one day after his installment as interim CEO last July. If so, then it can truly be said that the day Jobs stepped up to bat was the day Apple stopped following and started leading again.

The iMac proves that all of Apple's talk about "thinking different" wasn't empty hype. Today, Apple seems to be marching down a path different from the one it's been treading the past few years. It's the path taken by a company that realizes it must commit to innovation in order to succeed. And it's right where Apple belongs.

Will the iMac be as important as the original Mac? Only time will tell. But I will say this: As I sat in the Flint Center Theater on May 6, 1998, and watched Steve do his thing, it sure felt like 1984 to me. **m**

Send your feedback to visionthing@macworld.com. Andy promises to read his e-mail as soon as he gets back from the Volkswagen dealership.

Macworld Exclusive

The iMac Cometh

Apple Trades on Nostalgia with a Groundbreaking New Consumer Mac

By Andrew Gore and Anita Epler

RETRO IS IN, AND STEVE JOBS KNOWS IT. HE'S REACHED INTO APPLE'S past in hopes of blazing a trail back into the hearts of consumers, with a daring new entry-level Macintosh: the iMac. Two years ago, Apple quietly exited the low-cost computing market, citing an inability to compete with manufacturers of Windows-based PCs on price and time-to-market issues. Since that time, the company downsized and, according to interim CEO Jobs, became much more efficient and able to deliver new products faster. As a result, Jobs says, Apple is ready to reenter the consumer market with a dramatic new Macintosh that relies as much on nostalgia as it does on bold technology and design. At $1,299, the iMac offers leading-edge capabilities, a breathtaking design, and a bargain price.

For years, Apple relied on pedestrian designs for its desktop computers, leaving visual innovation to PowerBook designers. The iMac is different: it demands to be noticed, sporting a fresh, ultramodern design that is at the same time very familiar.

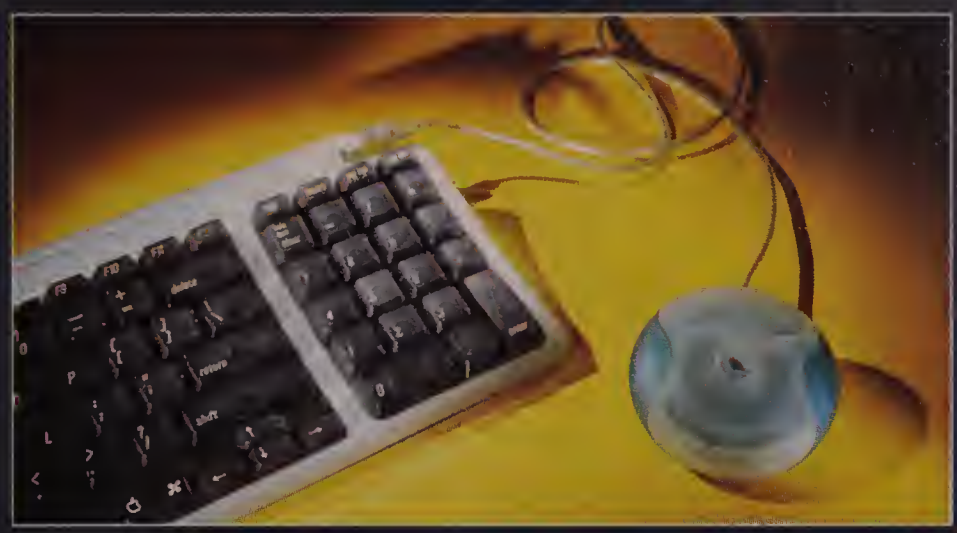
It's hard not to recognize the iMac's lineage: the all-in-one case, the tiny footprint, even the integrated handle—all suggest the original Macintosh. But this is where the similarities end. Using translucent plastics of "ice" and "Bondi blue" (in homage to the Australian beach), Apple's industrial-design group created a computer without a single straight line—even the keyboard components are curved. The case allows through just enough light to suggest the outlines of the iMac's internal works without revealing too much.

Every piece of this system—from cables to key caps—uses translucence, curves, and light to great effect. The round mouse reveals a tracking ball that's half white and half blue-green—watching the mouse while it's in motion can be mesmerizing. Adding to the space-age effect, Apple will use holographic stickers for port identifiers, FCC tags, and other labels. A translucent white flip-down foot props up the keyboard, coordinating nicely with the iMac's aquamarine appendage.

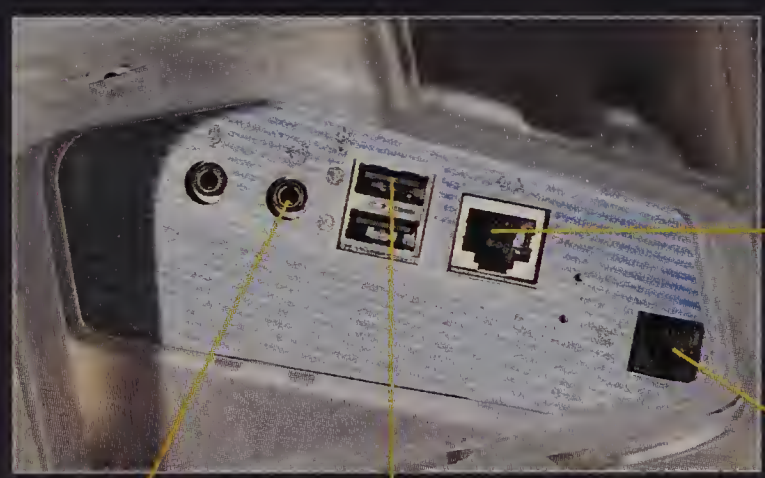
Slightly Ahead of Its Time

Breakthrough design doesn't stop on the iMac's surface: a cutting-edge logic board hides behind the futuristic plastics. A 233MHz PowerPC G3 processor complete with a 512K backside cache—a combination that should yield respectable performance—lies at the heart of the newly designed board. Like the new G3 PowerBooks (see *Reviews*, in this issue), the iMac uses SODIMM RAM, a common memory standard on Wintel PCs. This design choice should make it easy and inexpensive to expand the iMac beyond its standard 32MB of RAM, up to its 128MB maximum. A daughtercard houses the CPU, two RAM slots, and a new OpenFirmware ROM (see the sidebar "CHRP-Like Simplicity Reborn").

The CPU daughtercard connects to the main logic board via a speedy, 66MHz PCI system bus. The iMac comes with the ATI Rage IIc 2-D/3-D accelerated-graphics chip set and 2MB of SGRAM for video. Connectivity features include 10/100BaseT Ethernet via an autonegotiating RJ-45 jack, a 4-Mbps IrDA infrared port, a 33.6-Kbps modem, and two 12-Mbps Universal Seri-



CLEARLY STYLISH The round mouse's translucent case lets you watch its two-color ball rotate and spin as you drag your cursor—a hypnotic effect. Like those of the G3 PowerBooks, the iMac's keyboard sports function keys and inverted-T cursor keys. Like all things iMac, the key caps are transparent, too. The keyboard offers two USB ports (one is used to connect the mouse) and a USB hub, to allow daisy-chained devices. A hardwired cable connects the keyboard to the iMac, leaving the second port free.



This RJ-45 jack looks like a standard Ethernet port, but it combines 10BaseT and high-speed 100BaseT capabilities in a single, autonegotiating connector.

If the iMac's built-in SRS speakers don't move you, you can attach external speakers here. An audio-in jack is located nearby.

Twin hot-pluggable 12-Mbps Universal Serial Bus (USB) ports are the iMac's only connection to the outside world, in lieu of the familiar SCSI, serial, and ADB ports. The keyboard uses one plug, leaving the other free for a scanner, external modem, printer, removable-media drive, or other external device.

A 33.6-Kbps software modem lets you surf the Net at moderate speeds. The iMac supports faster connections via external USB modems.

CHRP-Like Simplicity Reborn

USING WIDELY AVAILABLE TECHNOLOGY TO REDUCE COSTS WAS ONE OF THE KEY concepts behind IBM, Motorola, and Apple's now-abandoned Common Hardware Reference Platform (CHRP) specification. The iMac isn't CHRP-based, but it's darn close, featuring PC-standard RAM, USB ports for connectivity, and—most surprising—an OpenFirmware ROM.

Those who followed the CHRP saga will recall that an OpenFirmware ROM contains only minimal hardware-addressing instructions, unlike current Mac ROMs that carry complex, machine-specific instruction sets. With OpenFirmware, most instructions are instead loaded into RAM.

As a result, the Mac OS takes up more RAM on the iMac, but future ROM updates will be much easier to make, shortening the production times for new Macs dramatically. As the iMac's marketing manager told us: "The work we did on CHRP is the main reason why we could develop the iMac in just ten months."

PHOTOGRAPHY BY ARNOLD TIOSEJO

The iMac's integrated microphone is similar to those found on Apple's AV monitors and all-in-one systems.

The 15-inch (with 13.8-inch viewable area) shadow-mask monitor features high refresh rates—117MHz at standard resolution, down to 75MHz at maximum resolution—to reduce flicker, and a 0.28 dot pitch for enhanced readability.

A full-speed (4-Mbps) IrDA-compliant infrared port lets you beam data to other IrDA devices such as PDAs, PowerBooks, and printers.

Gone are the days of loading software from floppies—at least Apple hopes so. You'll use this 24× ATAPI CD-ROM drive to install all your programs, unless you download them from the Web.

The CPU sports its own power button. A green light indicates power is on; amber denotes the iMac is asleep.

Twin headphone jacks let two users use a single iMac—a feature that's especially welcome in classrooms.

Like its keyboard, the iMac has a flip-down foot that tilts and raises the system.

Built-in stereo speakers offer simulated surround sound (SRS).

USB: Ready for Prime Time?

PERHAPS THE BIGGEST VARIABLE IN THE IMAC'S EQUATION IS Apple's renunciation of its old connectivity standbys—SCSI, ADB, and traditional Macintosh serial ports—in favor of the Universal Serial Bus (USB).

The bad news is that no current Mac peripherals support USB. Unless printer, scanner, or other external-device manufacturers take the time to write special drivers and provide adapter cables, chances are that iMac owners won't be able to use any devices they already own—or those released before the iMac's debut. It's physically possible to connect non-USB peripherals to the iMac with an adapter, but peripherals vendors must write USB drivers before their devices can communicate with the iMac.

Apple claims that hardware vendors will offer a wide variety of USB devices for the iMac, although the company was unwilling to reveal names at press time. Surprisingly, Apple itself has no plans to offer critical devices such as floppy and Zip drives and instead will rely on third parties.

Although USB offers an inexpensive and speedy alternative to traditional serial and ADB, it's a poor substitute for SCSI because the speeds of USB devices are interdependent: the more active devices on the bus, the slower each USB peripheral is likely to perform—a major issue for storage products.

But the good news is that a machine equipped with USB can support up to 127 logical devices, including disk drives, keyboards, mice, modems, scanners, cameras, printers, and even monitors. Still, the iMac's two ports might seem rather skimpy, considering that every peripheral device has to have its own connection. However, because USB uses a hub topology (like Ethernet), adding more ports is simply a matter of connecting a powered USB hub, a feature built into many USB devices. The keyboard that comes with the iMac acts as such a hub: both the mouse and another USB device can be plugged into it.

Form follows function on the iMac's back: these arcs and dots aren't just decorative, they're actually ventilation holes.

Like the original Mac, the iMac is totable. An integrated handle lets the 40-pound unit be easily moved and offers a place to thread a security cable.

As with Apple's recent all-in-one education Macs, a handy rear door allows access to a slide-out chassis housing both the main logic board (and its RAM-and-processor daughtercard) and storage devices.

You'll find the iMac's ports behind this stylized door. Underneath, a raceway keeps peripherals' cords and cables from cluttering the iMac's clean lines.

All iMac components—yes, even the power cord—are translucent.

al Bus (USB) connections.

Rounding out the package, the iMac comes with audio-in/out ports on the side of the unit, two headphone jacks on the front of the case, and a low-noise digital-audio chip that supports simulated surround sound (SRS) on the iMac's two integrated speakers.

A rear door offers access to a slide-out chassis that houses the logic board and media bays, making it easy to upgrade both RAM and storage devices; a 4GB EIDE hard drive and a 24× ATAPI CD-ROM drive are standard equipment.

Like the original Macintosh, the iMac sports a built-in display. The shadow-mask 15-inch monitor offers a 13.8-inch viewable area with a 0.28 dot pitch; it supports 24-bit color at 640 by 480 and 800 by 600 pixels, and 16-bit color at 1,024-by-768-pixel resolution. Beefing up the SGRAM to 4MB provides 24-bit color at the highest resolution.

The Missing Links

Considering all these amenities, the most shocking part of the iMac isn't what it offers, but what it lacks. The iMac has no floppy drive, which might be forgivable if there were a Zip drive or other removable-media option, but there isn't.

And most dramatically, this new consumer offering has no SCSI port, no standard serial ports, and no ADB ports. Apple has opted to replace these familiar connections with USB, a high-speed serial architecture that has suffered from slow adoption on the Wintel platform despite its technical advantages (see the sidebar "USB: Ready for Prime Time?"). Currently, no USB devices exist for the Mac.

The Once and Future Macintosh

Once Apple gets peripheral issues ironed out—and Apple assures us that it will in time for an August launch—it seems the iMac is destined to be a hit among the installed base of Mac users, hungry for a machine they can be excited about. The real question is whether Apple will be able to convince current non–Mac users—or even non–computer users—to buy an iMac.

Here, like so many vendors, Apple is relying on the popularity of the Internet. It's hoping that the Mac OS's legendary ease of use, combined with the iMac's multitude of built-in networking options (100BaseT is a natural for DSL and cable-modem connections, for example), will help bring more users into the Macintosh fold. Apple has set its sights high for the iMac; although they declined to state how many units will be manufactured, marketing managers told us that the iMac launch would be "probably the biggest in Apple history."

Will this latest chapter in the Macintosh saga be Apple's success story at last? Only time will tell. m

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- 250 sheet Universal Tray
- PastScript® Level 2 campatible, PCL 5
- 80 PastScript fants, 15 PCL fants
- 16 MB RAM expandable ta 64 MB
- EtherTalk, TCP/IP
- Ethernet® (10 Base T, 10 Base2), NetWare®
- Bi-directional Parallel, LocalTalk®, RS422

2nd Paper Feeder* (Includes 500 sheet Universal Tray)	Add $399
Extra 8 MB memory	Add $49

Platinum Exchange Warranty Program:

Additional year	Add $129
Twa additianal years	Add $194
Three additional years	Add $275

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Business Lease: $45 Month/36 month lease

Elite XL 608 LC

- 600 x 600 dpi resalutian
- 8 pages per minute
- 1 year Platinum Exchange Warranty
- Maximum print area: 11" x 17"
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- 250 sheet Universal Tray
- PastScript® Level 2 campatible, PCL 5
- 80 PastScript fonts, 15 PCL fants
- 8 MB RAM expandable ta 64 MB
- EtherTalk, TCP/IP
- Ethernet® (10 Base T, 10 Base2)
- Parallel, LacalTalk®, RS422

2nd Paper Feeder* (Includes 250 sheet Universal Tray)	Add $319
2nd Paper Feeder* (Includes 500 sheet Letter Tray)	Add $419
Extra 8 MB memory	Add $49

Platinum Exchange Warranty Program:

Additional year	Add $159
Twa additianal years	Add $239
Three additianal years	Add $339

$1599

Business Lease: $56 Month/36 month lease

*Elite 12/600, Elite 1212, and Elite XL 608 LC suppart ane additional paper feeder. The Elite XL 20/600 and Elite XL 20/800 suppart twa additianal paper feeders.

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- 285 PostScript fonts, 15 PCL fonts
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- EtherTalk, TCP/IP
- Ethernet® (10 Base T, AAUI), NetWare®
- Bi-directional Parallel, LocalTalk®, RS422

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Three additional years	Add $381

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Elite XL 20/800

New

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- 20 pages per minute
- 1 year Platinum Exchange Warranty
- Maximum print area: 13" x 35"
- Ledger, letter, legal, A3, A4, envelope
- 500 sheet Universal Tray
- PostScript® Level 2 compatible, PCL 5
- 285 PostScript fonts, 15 PCL fonts
- 24 MB RAM expandable to 64 MB
- EtherTalk, TCP/IP
- Ethernet® (10 Base T, AAUI), NetWare®
- Bi-directional Parallel, LocalTalk®, RS422

2nd or 3rd Paper Feeder* (Includes 500 sheet Universal Tray)	Add $299
Extra 8 MB memory	Add $49

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News

industry

Apple Profit, Consumer Macs Signal Comeback

SECOND-QUARTER UNIT SHIPMENTS UP AS G3 INTERNET MACS DEBUT

by Stephen Beale

LARRY GOODE

Score two for Apple. On April 15, the company reported a $55 million profit for the second quarter of fiscal 1998, much higher than the $21 million analysts had predicted. Since Apple also posted a $47 million profit for the first quarter, it has now achieved its first back-to-back profitable quarters since 1995, suggesting that interim CEO Steve Jobs's cost-cutting efforts—as well as brisk sales of G3 Macs—are bearing fruit. Adding to the momentum was Apple's announcement on May 6 that the company's consumer machine, the iMac, will ship in August.

Internet-Age Mac Being billed as "the Internet-age Mac," the iMac will feature a 233MHz G3 processor, 32MB of RAM (expandable to 128MB), 10/100BaseT Ethernet, a built-in 15-inch backlit display, an internal 33.6-Kbps modem, and USB and infrared ports—all for $1,299.

But as hopeful as this news is, Apple is not out of the woods yet. While this is the second consecutive quarter in which sales picked up, the number is still a far cry from the 932,000 Macs sold in the fall of 1996. Apple shipped 650,000 units in the quarter—about half of them G3's—up from 635,000 in the first quarter. At the same time, though, second-quarter revenues declined to $1.4 billion after holding steady at $1.6 billion or more the previous four quarters. Chief Financial Officer Fred Anderson blamed this in part on an industry trend toward lower system prices, as well as declining sales of PowerBooks and imaging hardware—printers, scanners, displays, and digital cameras. However, he expects higher sales in the fourth quarter as Apple ships new G3 PowerBooks (see *Reviews*, in this issue) and rolls out the iMac.

The results confirmed that Apple's first-quarter profit was not a fluke and reinforced a growing perception on Wall Street that Jobs has at least temporarily reversed the company's decline. Since taking over last July, Jobs has ruthlessly cut R&D and administrative costs, pared down Apple's product line, and boosted the company's advertising efforts.

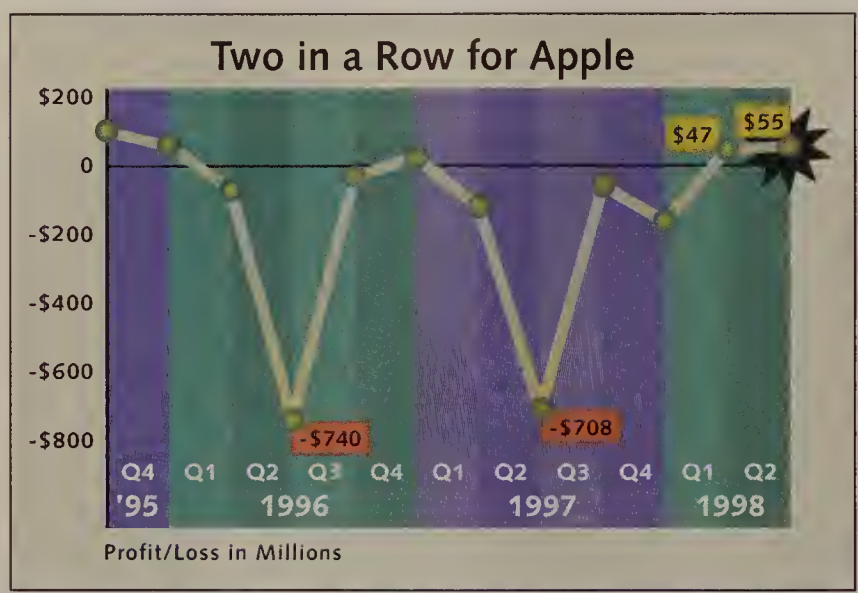
Before Jobs came aboard, conventional wisdom held that Apple's survival depended on

continues

increased market share. Jobs's strategy, in contrast, has been to maximize revenue from existing customers in the graphics and education markets. In announcing the most-recent results, Anderson made it clear that Apple still sees fertile ground in its installed base. "That's our first priority," he said, noting that many users have yet to upgrade to the latest generation of speedy Macs.

Jobs's strategy seems to be working—one reason why the search for a permanent CEO has been put "on the back burner," says Anderson.

Quicken for Mac Is Back Another victory for Apple has come courtesy of Intuit, maker of the popular personal-finance package Quicken. Shortly after Apple's quarterly earnings were announced, Intuit declared that poor sales were forcing it to phase out the Mac version of Quicken—an especially disturbing sign of waning confidence, since Intuit CEO Bill Campbell sits on Apple's board. However, at Apple's annual shareholders meeting April 22, Jobs hinted that Intuit might reconsider and told shareholders to expect a joint announcement from the two companies in early May. Sure enough, on May 5, Apple and Intuit announced not only that they will jointly promote Quicken 98 but also that Intuit plans to ship a new version of Quicken for Macintosh in 1999.



For the first time since 1995, Apple scored back-to-back profitable quarters.

multimedia

Apple Mines QuickTime in License Deal

DEVELOPERS MUST PAY FEE OR RUN PROMO

by Stephen Beale

Apple's QuickTime software is widely regarded as one of the major enabling technologies for producing multimedia and digital video. But until recently, QuickTime provided no direct benefit to Apple's bottom line. Now, with the release of QuickTime 3.0, Apple has come up with a new licensing scheme that forces multimedia developers to make a choice: either pay licensing fees or distribute a movie promoting the benefits of Apple's $30 QuickTime Pro authoring software.

Going Pro When you download QuickTime 3.0 from Apple's Web site, you also get an encrypted copy of QuickTime Pro, which offers several enhancements to the base software, including the ability to run movies full-screen and cut and paste one movie into another. To run QuickTime Pro, you call Apple and pay $30 to obtain a decryption code.

Prior to QuickTime 3.0, developers of multimedia-authoring software and CD-ROM titles could distribute QuickTime with their products at no charge. Under the new program, developers must pay Apple $1 for each copy of QuickTime they distribute, or include a short movie urging users to upgrade to QuickTime Pro. The movie plays when you install QuickTime and remains thereafter on your desktop. If you delete the movie, it plays again when you run the multimedia software.

Save Your Movies For the most part, QuickTime Pro adds new features not available in previous versions of QuickTime. But there's one big exception: the ability to save QuickTime movies to your hard disk. In QuickTime 2.5, Apple's MoviePlayer software let you save QuickTime movies downloaded from the Web. However, to save movies under QuickTime 3.0, you'll need QuickTime Pro—at least officially.

Soon after Apple released QuickTime 3.0, users who installed the software found that they could save movies in MoviePlayer 2.5.1, which is part of QuickTime 2.5 but also works with the new version. If you want to save QuickTime movies but don't want to fork out $30 for QuickTime Pro, be sure you keep a copy of MoviePlayer 2.5.1 in a location where it won't be overwritten by the new software.

Developer Reaction Multimedia developers appear to be divided about the new licensing terms. Some have complained that the deal bur-

Merger Mania Hits Mac Market

AS APPLE FIGHTS ITS WAY BACK TO PROFITability, a wave of mergers and acquisitions has hit some of the best-known vendors in the Mac market:

- On April 5, Electric Image, developer of the Mac-based ElectricImage Animation System, announced that it will merge with Play, a vendor of Windows-based digital-video software.
- On March 31, Global Village announced that it would sell its modem business—and Global Village brand name—to Boca Research. Reborn as OneWorld Systems, Global Village will refocus on developing Windows NT–based network servers.
- At Seybold New York in March, Wamnet, a high-speed digital-transmission service for graphics professionals, announced that it had acquired 4-Sight, a developer of ISDN prepress software.
- On March 5, La Cie, a vendor of displays, scanners, and storage devices, announced that it would purchase the assets of mail-order disk-drive vendor Alliance Peripheral Systems (APS Technologies). Mac-clone vendor APS had filed for Chapter 11 bankruptcy protection in January.
- Quark, after acquiring Mfactory last year, said in March that it would discontinue the company's Mtropolis multimedia-authoring program.

So what are Mac users to think? Eric Lewis, manager of personal systems research for International Data Corporation, cites two main factors behind the merger mania: the shrinking Mac market and ongoing consolidation in the PC industry. Global Village in particular, he says, was unable to succeed as a Mac-only modem vendor.—MACWORLD STAFF

dens them with new financial and bookkeeping responsibilities if they want to avoid being promotional vehicles for QuickTime Pro. Others say they can understand Apple's desire to make money from the software.

"Apple has provided real enabling technology and they deserve to get paid for it," says Scott Bowman, director of research and development for Insync Media, a Los Angeles–based multimedia producer. However, he thinks Apple should reduce the $1-per-copy charge for high-volume projects. He also believes that some developers will leave it to their customers to download QuickTime, bypassing the licensing process entirely.

Canon, Epson Join Megapixel Parade

DIGITAL-CAMERA MANUFACTURERS ARE PACKING IN the pixels with a new generation of high-resolution cameras. The new PhotoPC 700 from Epson America (310/782-0770, www.epson.com) sports a 1.3-megapixel CCD, producing a total resolution of 1,280 by 960 pixels. The $800 camera features 4MB of internal storage and can also store images on CompactFlash media.

Canon (800/652-2666, www.ccsi.canon.com) has introduced a pair of new cameras, the PowerShot A5 and PowerShot Pro 70. The $700 PowerShot A5 (pictured) features 1,024-by-768-pixel resolution—just shy of megapixel capability—and stores images on an 8MB CompactFlash card included in the package. It's scheduled to ship in July. The PowerShot Pro 70, scheduled to ship in the third quarter for less than $1,500, features 1,536-by-1,024-pixel resolution, a 2.5× zoom, and slots for two CompactFlash cards.—MACWORLD STAFF

ARNOLD TIOSEJO

multimedia

Video Painting Stars in Vegas

POST, PUFFIN, AND DISCREET LOGIC SQUARE OFF AT NAB SHOW

by Brooke C. Wheeler

New video-painting programs are making it easier than ever to create frame-by-frame video effects on your Mac. With prices ranging from $895 to $2,495, these programs offer sophisticated tools that were once the province of elite film-production houses.

At the recent National Association of Broadcasters (NAB) show in Las Vegas, several vendors demonstrated new or upgraded video-painting products for the Mac.

Natural Media Roto, a $995 program from Post Digital (408/469-7678, www.postdigital.com), combines natural-media painting tools with real-time video playback and rotoscoping capabilities; the latter let you create complex masking effects. Features include keyframe animation, a Bézier tool for drawing custom shapes, and a particle-painting tool that lets you create dynamic sparks and lightning effects. The software was featured in Apple CEO Steve Jobs's NAB keynote as an example of QuickTime 3.0 capabilities.

More Commotion Challenging Roto is Commotion, a $2,495 video-painting program from Puffin Designs (415/331-4560, www.puffindesigns.com), developed by a special-effects supervisor at Industrial Light & Magic. Puffin recently announced Commotion 1.5, which features a motion-tracking tool that lets you add an unlimited number of points to track object movement over multiple frames.

Video Vectors Meanwhile, Discreet Logic (514/393-1616, www.discreet.com) announced a new version of the video-painting tool formerly known as Illuminaire Paint. Paint 2.0 uses vector-based drawing tools to add special effects to video frames. You can get the entry-level version for $895, or an enhanced version that offers motion-tracking and real-time video-playback capabilities for $1,995.

Eat Your Fibre In other NAB news, several vendors introduced products that support the high-speed Fibre Channel Arbitrated Loop (FC-AL) networking protocol.

Transoft Technology (805/897-3350, www.transoft.net) unveiled the FibreNet Storage Area Network, a cross-platform networking system that includes FC-AL PCI cards, switches, and server software. Prices range from $1,995 for a 4-user package to $4,995 for 200 users. Hammer Storage Solutions (510/608-4000, www.hammerstorage.com) announced the SledgeHammer Pro FC array, a 12-bay FC-AL disk array that works on Macintosh, Silicon Graphics, and Windows NT systems; prices range from $13,000 to $50,000. CharisMac Engineering (530/885-4420, www.charismac.com) demonstrated FibreShare, its $1,500-per-seat software package that provides the ability to manage shared storage networks. Atto Technology (716/691-1999, www.attotech.com) showed FibreBridge, a $3,495 Fibre Channel–to–Ultra SCSI converter.

A number of companies introduced new digital-video products. Videonics (408/866-8300, www.videonics.com) previewed the Effetto Pronto, a $5,000 package that combines compositing, titling, and 3-D video-effects software with a PCI accelerator board. Scitex Digital Video (650/369-5111, www.scitexdv.com) and Radius (408/541-6100, www.radius.com) introduced new versions of their digital-video–editing packages. Macromedia (415/252-2000, www.macromedia.com) demonstrated its long-awaited Final Cut video-editing software but said the package will not ship until this summer.

ProMax Technology (714/727-3977, www.promax.com) introduced MovieTweaker, which provides color-correction tools for video. NewTek

continues

BRYAN WIGGINS

(210/370-8000, www.newtek.com) introduced LightWave 5.6, an update to its 3-D modeling, rendering, and animation package.

storage

The Flash Is in the Floppy

FLASHPATH LETS YOU USE SMARTMEDIA IN YOUR MAC'S FLOPPY DRIVE

by Kevin Mitchell

SmartMedia cards—stamp-size media also known as solid-state floppy-disk cards—offer a cost-effective means of storing images in digital cameras. But until now, you needed a PC Card adapter and PC Card reader to copy the pictures directly to your Mac. Toshiba, which invented SmartMedia, has stepped into the breach with an adapter that lets you use the cards in a standard floppy-disk drive.

Like a Floppy Toshiba's FlashPath consists of an adapter that resembles a 3.5-inch floppy disk, along with software that allows use of the adapter in most floppy drives. Toshiba released a Windows version of the software in March and planned to ship a Macintosh version by the end of May.

Instead of the thin, rotating platter in conventional diskettes, FlashPath uses a fixed magnetic strip to transfer data from the SmartMedia card to the drive heads. You still hear the *chunk-chunk* sound as the heads move from track to track, but no more *swish-swish* sound from spinning floppies. Toshiba says it has tested the adapter with a wide range of disk drives, including the drives used in Apple-branded Macintoshes and Mac clones.

Extra Capacity The adapter, which sells for $99, can handle the current 3.3-volt 8MB SmartMedia cards, which sell for $89, as well as 2MB ($25) and 4MB ($39) cards, which operate at 3.3V or 5V. Toshiba expects the SmartMedia cards to reach capacities of 12MB before June and 32MB by year's end. In addition to transferring images from digital cameras, the adapter can be used as a high-capacity diskette, although cost per megabyte is higher than with other media, such as Zip disks. Olympus plans to sell the adapter as an option for its digital cameras.

online

XML Drives Web Graphics Proposal

ADOBE SUBMITS XML VECTOR FORMAT TO W3C

by Stephen Beale

The eXtensible Markup Language (XML), a new Web authoring standard that offers greater flexibility than HTML, has become the launching pad for a vector-graphics format proposed by Adobe Systems. In April, Adobe submitted a proposal for the XML-based Precision Graphics Markup Language (PGML) to the World Wide Web Consortium (W3C), the industry body that governs Web standards.

Based on the software that underlies Adobe's PostScript as well as its Portable Document Format, PGML will support features such as clipping paths, progressive rendering, font embedding, and the ability to include vector graphics in HTML text streams. The language will also provide simple animation functions, such as motion paths for objects. PGML's scripting capability—to be implemented in JavaScript or some other scripting language—will let you produce sophisticated animations not directly supported by the language.

PGML poses a challenge to Macromedia's Flash, currently the most popular vector format for the Web, and also provides an alternative to the vector-animation track in QuickTime 3.0.

But before it can become acknowledged as a standard, PGML must work its way through the W3C accreditation process, and some key aspects of the technology have yet to be addressed. For example, Adobe's submission notes that PGML's verbose syntax will require file compression, but does not specify which compression scheme should be used.

PGML provides a hint of XML's potential for extending the Web's graphical capability. Its ability to let Web authors and software developers define their own markup tags makes it highly customizable. And because XML support will be built into future versions of leading Web browsers, you won't need special plug-ins to view the content.

ARNOLD TIOSEJO

ViewSonic Slashes LCD Prices

THE PRICE GAP BETWEEN LCD MONITORS AND THEIR CRT counterparts keeps shrinking. In April, ViewSonic (909/869-7976, www.viewsonic.com) broke the $1,000 barrier by announcing a 34 percent price reduction in its ViewPanel display line. The 13.8-inch VPA138, formerly $1,366, now sells for an estimated street price of $995. Also reduced: the 14-inch VP140, from $1,459 to $1,145; the 14.5-inch VPA145, from $1,595 to $1,195; and the 15-inch VPA150, from $2,195 to $1,445.—MACWORLD STAFF

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Reviews

PowerBook G3

NEW PORTABLES DELIVER BREAKTHROUGH DESIGN, FEATURES, AND SPEED

PHOTOGRAPH AND SCREEN IMAGE BY KEVIN CANDLAND

BACK IN ITS HEYDAY, THE PowerBook epitomized the best of all things Macintosh: ease of use, innovation, and that certain je ne sais quoi not found anywhere else. But over time, poor design and reliability issues caused the once-mighty mobile Mac to fall from its lofty heights.

It's been a long climb back from ignominy, but with the latest PowerBook generation, Apple once again leads the market in design, performance, features, and—something no previous PowerBook has been able to claim—value.

Heavenly Design

With the new PowerBook G3 line, distinctive design is once again a hallmark of the mobile Mac. The sleek black chassis is appropriately Batcave-esque, since this curvy case incorporates an array of clever gadgets and hidden tricks. For example, a combination of smooth and textured case surfaces ensures a solid grip.

Among the other design enhancements are quick-release handles for removing expansion modules—including dual batteries—from the PowerBook's two bays, a pop-up keyboard to ease access to internal slots, labels on the inside of the port door to help you navigate, and a modem port intuitively located next to the PC Card slots.

The keyboard alone sports a half dozen improvements: scissor switches for quieter, firmer typing; inverted-T cursor keys; access to alternate key functions (for numeric or PC-standard commands); and brightness, mute, and volume buttons. The new PowerBook's built-in speakers deliver sound quality and stereo separation far superior to those of previous models. The batteries even sport button-activated LED power gauges.

No-Compromise Performance

The new PowerBook G3—confusingly identical in name to the original $5,700 PowerBook G3 (see *Reviews*, April 1998), which was essentially an upgraded PowerBook 3400—is based on the same logicboard architecture as Apple's Pentium-trouncing Power Mac G3 systems, so it's no surprise that these new models are the fastest portables Apple has ever built. But what might come as a shock is that these portables are only nominally slower than their desktop counterparts.

You can configure your new PowerBook G3 with one of three processor-and-bus combinations. At the low end, Apple offers a 233MHz processor with a 66MHz

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OUTSTANDING: ♦♦♦♦♦ VERY GOOD: ♦♦♦♦ GOOD: ♦♦♦ FLAWED: ♦♦ UNACCEPTABLE: ♦

system bus and no backside cache. Next up, a 250MHz G3 pairs with an 83MHz system bus and a 1MB backside cache running at a 2:1 cache-to-bus–speed ratio; the top-of-the-line 292MHz G3 comes equipped with the same cache and bus as its 250MHz sibling.

The new PowerBooks don't just sport wicked-fast processors, though; they also contain the fastest graphics subsystems ever in a PowerBook, based on the ATI 3D Rage LT chip set.

Featured Player

The list of standard features on Apple's new portables is long: built-in 10BaseT Ethernet, a VGA-out port, full-speed IrDA infrared networking, two high-speed CardBus PC Card slots, and a 20× CD-ROM drive. A floppy drive isn't standard on the low-end configuration, but it's on the list of add-ons that help the new PowerBooks really shine.

Remember when buying a Mac meant living with limited options? No more. The PowerBook G3 line offers three display choices: an 800-by-600 pixel 12.1-inch passive-matrix screen, as well as 13.3-inch and 14.1-inch active-matrix screens with a resolution of 1,024 by 768 pixels. The two larger screens come standard with S-Video out, which is optional with the smaller screen. PowerBook models with a 12-inch screen ship with 2MB of VRAM and display thousands of colors on the internal screen and millions on an external monitor. Those with a 13- or 14-inch screen come with 4MB of VRAM and provide millions on both displays.

You can equip your new PowerBook with a 2GB, 4GB, or 8GB internal drive. You can also trade the CD-ROM drive for a DVD-ROM drive for $200 through Apple's build-to-order Web site, or $399 through a dealer. You can get fast SDRAM preinstalled in 16MB, 32MB, 64MB, 128MB, or 192MB configurations. And you can add an optional K56flex internal modem.

For evaluation purposes, we tested representative low-, middle-, and high-end configurations. Our low-end system sports a 233MHz processor, a 12.1-inch display, 32MB of RAM, 2MB of VRAM, and a 2GB hard drive and sells for $2,299. In the midrange, we looked at a 250MHz system with a 13.3-inch display, 32MB of RAM, 4MB of VRAM, a 4GB hard drive, and a 56K modem, which costs $3,899. Our $5,599 high-end 292MHz model ships with a 14.1-inch display, 64MB of RAM, 4MB of VRAM, an 8GB hard drive, and a 56K modem.

Although these models are the best systems Apple has produced in years—desktop or portable—a few minor complaints remain. You can no longer run the PowerBook with the lid closed, due to thermal considerations. Overall, it's still too big and heavy, weighing in at about 7.5 pounds and measuring 12.7 by 10.4 by 2.0 inches.

Macworld's Buying Advice

If you've been thinking about purchasing a PowerBook, now's the time. Other than a couple of minor shortcomings, Apple hasn't missed a trick with this new line of portables. If you can swing it, foot the bill for the 14-inch display. It's bright, sharp, and offers almost as much viewable space as a 15-inch desktop monitor. You'll also want to opt for the 250MHz or 292MHz G3; stay away from the 233MHz if possible. For a few hundred bucks more, you can have a PowerBook with significantly more speed.

Of the configurations we tested, our favorite was the high-end system. Compared with similarly equipped Windows notebooks, it turns out to be a good deal—despite the $5,599 price—offering the best of everything. For those with slightly less expansive budgets, our midrange system came close to matching the advantages of the high-end PowerBook, for $1,700 less.—ANDREW GORE

PowerBook G3/233

RATING: ♦♦♦ **PROS:** Least-expensive G3 PowerBook; excellent features. **CONS:** Large size for its relatively tiny screen; lack of backside cache; no floppy drive. **COMPANY:** Apple Computer (408/996-1010, www.powerbook.apple.com). **DIRECT PRICE:** $2,299 as tested.

PowerBook G3/250

RATING: ♦♦♦♦½ **PROS:** Great mix of features and performance; top value. **CONS:** None significant. **COMPANY:** Apple Computer (408/996-1010, www.powerbook.apple.com). **DIRECT PRICE:** $3,899 as tested.

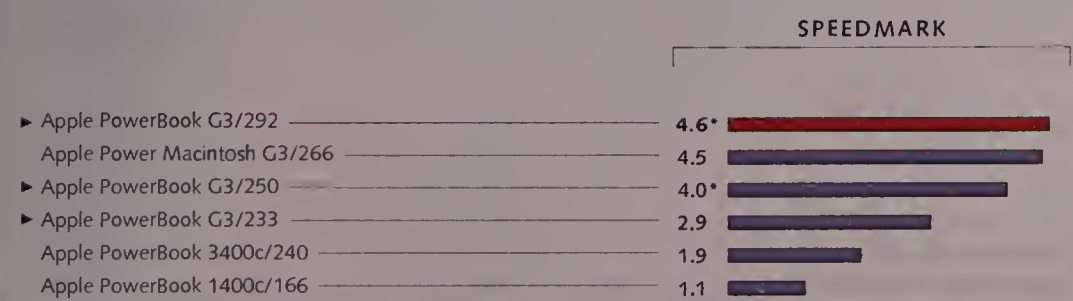
PowerBook G3/292

RATING: ♦♦♦♦½ **PROS:** Excellent feature set with no compromises; good value. **CONS:** None significant. **COMPANY:** Apple Computer (408/996-1010, www.powerbook.apple.com). **DIRECT PRICE:** $5,599 as tested.

Macworld LAB TEST

No Compromises: G3 PowerBooks Close In on Desktops

Best overall performance. Longer bars and higher numbers are better. **Bold** indicates the best result in a subsystem test. ► New system. SpeedMark scores are relative to that of a Power Macintosh 7100/80, which is assigned a score of 1.0. MacBench 4.0 scores are relative to that of a Power Macintosh 6100/60, which is assigned a score of 100.



MACBENCH

Processor	Disk	Graphics
1,027	**342**	**675**
895	362	566
884	286	606
450	245	407
337	226	232
154	153	129

The PowerBook G3/250 and G3/292 have a fixed 1,024-by-768-pixel display. As a result of longer scroll times for larger displays, their SpeedMark scores are slightly understated.

Behind Our Tests For detailed information on our benchmark suite, see "DayStar Millennium G3/307," *Reviews*, June 1998, or www.macworld.com/tests/.
—Macworld Lab testing supervised by Gil Loyola

QuickTime 3 Pro

APPLE'S MULTIMEDIA SOFTWARE GOES CROSS-PLATFORM

APPLE'S IMAGE MAY HAVE become a bit tarnished, but the company's crown jewel, QuickTime, shines brighter than ever with the latest release; the multimedia system software that revolutionized video and audio production and spawned new virtual-reality technologies is now making waves on the Web.

QuickTime 3 offers codecs for better-quality Web audio and video, built-in special effects and filters, and support for both a broader array of file formats and low-bandwidth vector animation. Besides forming a superior foundation for professional video editing, version 3 enhances QuickTime VR, Apple's virtual-reality technology, and is feature-identical on Mac and Windows platforms. (For details, see *News*, April 1998.)

But while multimedia developers knew what QuickTime 3 would bring to the screen, they *didn't* know they'd have to sit through a commercial to enjoy these benefits. Until you pony up $30 for the Pro version, you're treated to an annoying "upgrade to QuickTime 3 Pro" dialog box once a day (and if you got QuickTime 3 as part of a CD-ROM title, you may see the message every time you start that title).

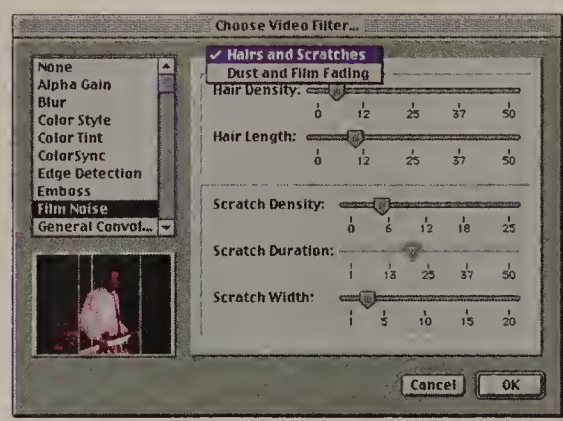
When you upgrade to QuickTime 3 Pro, you get a billboard-free desktop. You also get rudimentary video-editing capabilities, versatile file-importing and -exporting features, and the ability to save movies that are embedded in Web pages.

MoviePlayer Turns Pro

Among the enhancements in the Pro version are better authoring and playback in MoviePlayer, a simple utility that accompanies QuickTime 3. MoviePlayer Pro is no Adobe Premiere, but it does let you assemble movies by dragging and dropping selections. You can also extract audio tracks, convert audio files into QuickTime movies, export movie frames as image files, and more. And when you export a movie, you can apply special effects and filters (see "Making Movies").

With MoviePlayer Pro's Get Info command, you can examine many of a movie's attributes—to determine, for example, the duration, compression scheme, and sound formats. You can make modifications, such as adding copyright information and specifying alternate-language audio tracks, and you can resize and rotate movies.

What you *don't* get with MoviePlayer Pro is documentation. For that, you have to either go to Apple's Web site or download PDF versions from www.bmug.org/quicktime/mp3docs/.



Making Movies QuickTime 3 Pro's MoviePlayer Pro lets you apply effects and filters to clips when you export them. The Film Noise filter, shown here, simulates scratched, faded movie film.

If you're willing to endure the daily nagging, you don't have to upgrade to QuickTime Pro to take advantage of its best features. Third-party apps such as Premiere and Terran Interactive's Media Cleaner Pro can use QuickTime 3's new codecs; so can MoviePlayer 2.5, when used with MoviePlayer authoring extensions. (Apple has removed MoviePlayer 2.5 and the extensions from its site, but they're still available from shareware and freeware vendors.)

Think Windows—to a Point

One of the most remarkable things about both versions of QuickTime 3 is that all of the preceding applies to Windows 95 and NT as well as to the Mac OS (previous versions of QuickTime for Windows were limited to playback functions). In tests on a Pentium-based machine, QuickTime 3 Pro for Windows was on a par with the Mac OS version in terms of performance and interface. Apple has done an exquisite job of moving its crown jewel over to The Other Side.

At the moment, however, several of Apple's export extensions and utilities aren't yet available for Windows. The list includes several QuickTime VR–related extensions as well as a tool that creates reference movies. What's more, some Windows applications—including Premiere 4.2—don't support QuickTime 3. Until these applications are updated and QuickTime for Windows utilities appear, the Mac will remain the preferred platform for making QuickTime movies.

Browse and Buy

QuickTime 3's new browser plug-in enhances Web-based QuickTime by giving you a Settings dialog box in which you can specify your connection speed. The plug-in can then work with QuickTime 3 *reference* (multiple data-rate) movies to download the clip most appropriate for your connection speed. The new plug-in also greatly enhances QuickTime VR by supporting low-resolution streaming previews and URL hot spots in VR movies.

If you want to save movies that have been embedded in Web pages for later viewing, you must upgrade to QuickTime Pro; Apple removed that feature from the plug-in's base version.

You can't buy QuickTime 3 Pro in a box; the upgrade is sold only via Apple's Web site. After you download and install the standard version of QuickTime 3—all 7MB of it—go to the QuickTime Web site's upgrade page and enter your credit-card information. You'll then get a serial number to plug into the QuickTime Settings control panel. (My virtual shopping trip went smoothly: I had a serial number within one minute and an e-mail confirmation within ten minutes.)

Macworld's Buying Advice

Because Apple is letting software developers license and distribute QuickTime 3 Pro with their wares, you may not have to pay the $30 fee to go Pro. But if you aren't willing to wait, fire up that browser and buy it; there are more than enough goodies in the upgrade to make it worth the modest price.—JIM HEID

RATING: ♦♦♦♦½ **PROS:** Broad array of enhancements; superb cross-platform compatibility. **CONS:** No bundled documentation; some authoring tools not yet available for Windows; incompatible with some Windows applications. **COMPANY:** Apple Computer (408/996-1010, www.apple.com). **LIST PRICE:** $30

ScanAce 1236s

BUDGET SCANNER DELIVERS MORE BITS FOR FEWER BUCKS

THE SCANACE 1236S, FROM Pacific Image Electronics (PIE), brings the cost of 600-dpi, 36-bit color scanners to a new low. Although it's no serious threat to costlier scanners with comparable specs, its respectable performance and $180 street price make it a solid contender for entry-level users. Its software, however, places considerable demands on both the Mac and its user.

PIE's stripped-down ScanAce lacks some basics, including a power switch. Plugging it in turns it on; after 15 minutes idle, it shifts into a power-saving mode.

GIBSON

An external power adapter keeps the scanner light and small but power strip–unfriendly. Built-in active SCSI termination is nice; hiding the SCSI ID selector on the scanner's base isn't.

The bundled Presto ImageFolio application is similarly spartan. In contrast, the remarkably full-featured Jetsoft Art-Scan Pro plug-in offers levels of control from fully automated operation to low-level manual tweaking. It's even well documented. Notable features include batch scanning, drag-and-drop operation, ColorSync-based calibration, and a vector line-art scanning mode that converts scanned images to EPS files for draw programs.

By default, Art-Scan automatically performs cropping and level setting, producing scans quickly and easily. These scans lack the vibrant colors and sharp details of midrange scanners, but match anything we've seen at the sub-$200 price point. You can get truly impressive results with a hands-on approach to Art-Scan, so long as you're patient. Context-sensitive help concisely defines Art-Scan's many features, but the tools themselves aren't so straightforward.

The powerful color-correction dialog box is too small and cramped to make precise adjustments easily; the curves and levels endpoints are also confusingly reversed from those in Adobe Photoshop and don't accurately reflect the final scan. The sharpening dialog box is better designed, but Photoshop crashed when the preview feature was used. Clicking the zoom tool on an already-zoomed image unintuitively produces high-resolution previews in the main window—and this, too, caused crashes.

Allocating more memory makes Art-Scan more stable, but even at default levels, its RAM appetite seems voracious for an entry-level scanner plug-in. The ScanAce's box incorrectly says the software works with an 8MB Mac II; in reality, Art-Scan is Power Mac–only, and works sluggishly on a 32MB system.

The ScanAce 1236s also logged the slowest times of any scanner in Macworld Lab's recent tests. You can shave nearly a minute off the color-scan time by using Art-Scan's Speed Quality mode, but you'll spend more time compensating for the reduction in image quality in postscan editing than you'd save with this choice.

A Slice of PIE ScanAce (left) can't approach our reference drum scanner's colors and clarity (right), but its price is hard to beat.

Macworld's Buying Advice

If you're one of the rare folks who have a Power Mac with at least 64MB of RAM but modest finances and scanning needs, the ScanAce 1236s is hard to beat. Art-Scan's excellent features and quality are big pluses, but its rough edges are likely to frustrate many users.—PETER M STOLLER

RATING: ♦♦♦ **PROS:** Inexpensive; good scan quality; feature-rich scanning plug-in. **CONS:** Slow; software bugs and interface quirks; for Power Mac only. **COMPANY:** Pacific Image Electronics (310/618-8100, www.scanace.com). **LIST PRICE:** $219.

Macworld LAB TEST

Value-Priced Scanner's No Speed Champ

Best result in test. All times are in seconds. Shorter bars are better. Products listed in order of overall performance. ► New product.

	GRAY SCALE		COLOR	
	Preview	Scan	Preview	Scan
Umax Astra 600S*	21.1	18.7	29.8	69.7
Microtek ScanMaker V300	35.9	22.5	36.0	67.6
► PIE ScanAce 1236s	30.7	41.8	45.9	160.6

*Editors' Choice, November 1997.

Behind Our Tests For detailed information on our scanning benchmarks, see "Scan It," November 1997.—Macworld Lab testing supervised by Suzanne Courteau

Power Macintosh G3/300

MORE SPEED, BUT EXPANSION REMAINS LIMITED

YOU'D THINK THAT APPLE would have gotten the message by now: high-end users, particularly digital-video producers, need slots. Lots of them. But slots, alas, are the one thing the new Power Mac G3/300—the fastest Mac that Apple has ever shipped—ain't got.

With Apple's new custom-system program (see "The Build-to-Order Dilemma," May 1998), Power Macs can be purchased in gazillions of different configurations. The system we looked at sported a 300MHz PowerPC G3 processor with a 1MB backside cache and 128MB of RAM. The processor bus clocked at 66MHz; the cache bus at 150MHz. Our test system contained two 4GB ultrawide Quantum Viking drives connected to an Atto Ultra/Wide SCSI controller card. In addition to built-in graphics RAM, the system contained an IXMicro TwinTurbo 128 graphics accelerator. For networking, it included a 10/100BaseT network adapter card in addition to its built-in 10BaseT port.

Overall, this new 300MHz Power Mac G3 outperformed Apple's previous top-of-the-line model (the 266MHz G3) by a whopping 20 percent, due to major speed improvements in both processing and graphics speed—though MacWorks' DayStar Millennium G3/307 (see *Reviews*, June 1998) is still the speed champ.

And options abound. You can choose twin RAID-formatted 4GB or 9GB drives, for example. If your Mac doubles as your home entertainment center, you can request a DVD-ROM drive in place of a CD-ROM drive. Systems can be preconfigured with anywhere from 32MB to 384MB of RAM, and by the time you read this, there should be a PCI-based Apple FireWire card option. And yes, you can opt for a 56-Kbps internal modem.

ARNOLD TIOSEJO

But despite this panoply of options, the Power Mac G3 falls short when it comes to the most important aspect of flexibility: expandability. In case you lost count, our test system shipped with *all three* of its PCI slots already filled. A user who, for example, wanted to install Apple's FireWire card in this system would have to forgo high-speed networking, high-speed disk access, or graphics acceleration. Moreover, the Power Mac G3 systems offer only three RAM slots, so if you need more than 384MB of RAM—and many of this system's target users do—you're out of luck. If you need additional RAM or PCI-card expansion, you'll want to turn to the DayStar Millennium or the Umax SuperMac S900Base (see *Reviews*, March 1998)—at least while they're still around.

And how does Apple stack up in price? It's difficult to compare the Power Mac G3/300 with the MacWorks and Umax offerings, because these companies don't offer configurations similar to that of the Power Mac we evaluated. But we did check out Dell's Web site to see how Mac and PC pricing compares, and the picture isn't pretty. For $3,643, you can buy a Dell Dimension XPS R400 configured almost identically to our $4,779 Power Mac G3/300 (except for the Dimension's *400MHz* Pentium II processor, of course)—that's $1,136 less! Ouch. Even if you concede that the PowerPC G3 is a faster processor than the Pentium II, that's gotta raise some eyebrows.

Macworld's Buying Advice

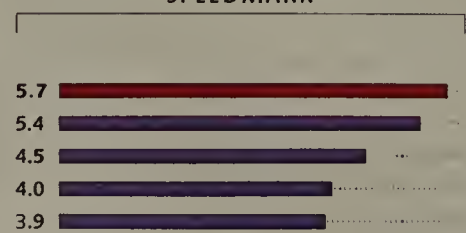
If you're in the market for a high-end Mac, Apple's put you in a bit of a quandary. For the moment, Umax and MacWorks offer more-expandable systems, but it's unclear how long either vendor will remain in the Mac market. Speedy as the Power Mac G3/300 is, it fails to address the needs of many creative professionals. Apple badly needs a tower model at the top of its line, with both PCI and RAM slots to spare.—HENRY BORTMAN

RATING: ♦♦♦ **PROS:** Fastest Apple system yet; RAID option. **CONS:** Limited RAM and PCI expansion. **COMPANY:** Apple Computer (408/996-1010, www.apple.com). **DIRECT PRICE:** $4,779 (as tested).

Macworld LAB TEST

Apple High-End System Still Not the Fastest Mac

Best overall performance. Longer bars and higher numbers are better. ► New system. **Bold** indicates the best result in a subsystem test. SpeedMark scores are relative to that of a Power Macintosh 7100/80, which is assigned a score of 1.0. MacBench 4.0 scores are relative to that of a Power Macintosh 6100/60, which is assigned a score of 100.

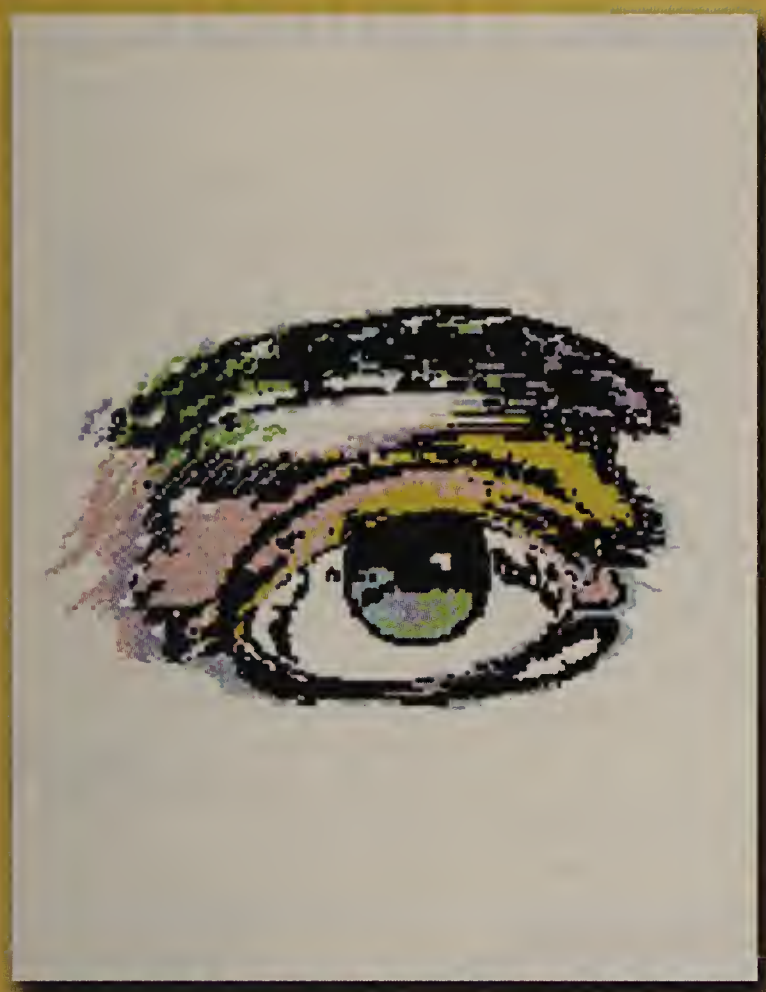


MACBENCH

Processor	Disk	Graphics
1,169	**653***	698
1,057	406*	**861**
895	362	566
787	303	531
744	351	486

*RAID disabled.

Behind Our Tests For detailed information on our benchmark suite, see "DayStar Millennium G3/307," *Reviews*, June 1998, or www.macworld.com/tests/. —Macworld Lab testing supervised by Gil Loyola



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Audio Plug-ins for Adobe Premiere

TOOLS CREATE COOL EFFECTS AND ENHANCE AUDIO QUALITY

WHETHER YOU WANT TO ADD weird sound effects to your digital-audio files or make your tracks cleaner and richer, four new audio plug-ins give you these capabilities within Adobe Premiere. Opcode Systems' Fusion:Vinyl 1.0 and Fusion:Vocode 1.0 plug-ins make clean digital audio sound like a warped, scratched record and make instruments sound as if they're talking; MaxxBass 1.0 and DeEsser 1.0, from Waves, enhance the bass and tonal qualities of music and recorded voices. Pick and choose to amend your plain-vanilla audio tracks.

Funky Effects

Opcode's Fusion:Vinyl 1.0 essentially dirties up clean digital audio with the real-world sounds of abused vinyl records. The controls include Record Surface effects such as Dirt, Static, Hiss, Wear, Scratched, and Warp; Turntable/System effects for replicating the low-frequency rumble of 33-, 45-, and 78-rpm turntables; and a variety of fun presets such as Left In Trunk, which faithfully mimics how a record would sound after being left in the back of a Pinto for a week.

Nostalgic for Damage Opcode's Fusion:Vinyl plug-in scruffs up clean digital-audio sound with adjustable warp, scratch, and turntable-rumble effects to mimic a damaged vinyl record.

Fusion:Vinyl works its sonic magic with *physical modeling:* instead of using sampled sounds of dirt and noise on vinyl, the plug-in uses custom algorithms to replicate the process of audio-quality degradation. Fusion:Vinyl is easy to use, produces incredibly realistic vinyl artifacts, and is simply a cool audio toy.

Fusion:Vocode 1.0 is a bit more esoteric than Vinyl. Vocoding involves using one sound to modulate another. For example, using a human voice as a modulator, you could process a sample of piano sounds; the result would be piano notes that sound as if they're spoken by a voice. Fusion:Vocode lets you use any sound as a modulator, and the CD-ROM includes a decent variety of sampled sounds to start your experimentation. It takes a little more work to get useful, pleasing results with Fusion:Vocode than with Vinyl, but the former does an admirable job of making the power of audio vocoding accessible.

Gimme Some Bass

Music that lacks punch often suffers from weak bass. To add some "whomp" to bass-weak tracks, Waves created the MaxxBass 1.0 bass-enhancement plug-in.

MaxxBass not only increases the volume of bass frequencies, but it also adds low-frequency harmonics to reinforce existing bass sounds. It's powerful and easy to control, and its variable audio filter and dynamic audio-compression controls let you remove very low frequencies to improve power without the audio's becoming "boomy" or muddy. Most important, as you change its parameters, MaxxBass generates real-time–preview audio loops. MaxxBass is really superb for beefing up underpowered audio clips.

Ssssay That Again?

High-frequency sounds have their own problems—especially in recordings of the human voice. One such audio gremlin is *sibilance*—the high-pitched "ess" and "shh" sounds people produce when they talk or sing—which can create a jump in volume. Moderating these sounds without muffling every other frequency is a crucial post-production process called *de-essing*, and Waves' simple and robust DeEsser 1.0 plug-in cures sibilant tracks.

DeEsser, like MaxxBass, delivers both ease of use and powerful features—albeit in a strangely half-empty interface. Its parameters include a variable volume threshold, a compression mode that determines whether de-essing is applied to the entire audio spectrum or just a portion of it, and an adjustable frequency slider to target the sibilance peaks. DeEsser also generates real-time–preview audio loops, and it has a visual feedback meter that shows the amount of sibilance attenuation (volume reduction).

Macworld's Buying Advice

Whether you want to enhance digital-audio files or mangle them beyond recognition, these four easy-to-use plug-ins deliver the goods. Waves' MaxxBass and DeEsser bring important audio-sweetening tools to the consumer level, while Opcode's Fusion:Vinyl and Fusion:Vocode provide a virtual galaxy of audio deconstruction and distortion.—DAVID BIEDNY AND NATHAN MOODY

DeEsser 1.0

RATING: ♦♦♦♦ **PROS:** Very easy to use; good documentation; great results even on poor audio material. **CONS:** Strangely half-empty interface. **COMPANY:** Waves (423/689-5395, www.waves.com). **LIST PRICE:** $200.

Fusion:Vinyl 1.0

RATING: ♦♦♦♦½ **PROS:** Excellent physical-modeling engine for vinyl artifacts; straightforward interface; good presets. **CONS:** Some bugs in Premiere version; lacks printed documentation. **COMPANY:** Opcode Systems (650/856-3333, www.opcode.com). **LIST PRICE:** $100.

Fusion:Vocode 1.0

RATING: ♦♦♦♦ **PROS:** Delivers unique effects; can use any sampled sound as modulation source; preview capability. **CONS:** Requires effort to learn how to use; lacks printed documentation. **COMPANY:** Opcode Systems (650/856-3333, www.opcode.com). **LIST PRICE:** $150.

MaxxBass 1.0

RATING: ♦♦♦♦½ **PROS:** Professional-level features; real-time–preview loops; solid interface; good documentation. **CONS:** A little pricey. **COMPANY:** Waves (423/689-5395, www.waves.com). **LIST PRICE:** $300.

"...this was the best still-frame performance I have ever seen from a camcorder."

Best Of The Year
Video Magazine, January 1998

"Remarkable...blurs the line between video and still cameras."

Best Of What's New
Popular Science, December 1997

"...it's a combination DV camcorder and digital still camera."

Golden Plug Award
E/Town, August 1997

"Input device of the year."

Hyper Award
New Media, March 1998

The Playback On This Digital Camcorder Is Nothing Short Of Stellar.

"Optura's thirty-frames-per-second speed will help capture those fleeting moments..."

Guy Tech Awards
GQ, December 1997

"Editors' Choice."

Editors' Choice
Finalist Award, Macworld, March 1998

"Top Pick-Digital Camcorder."

Editor's Choice Award
Petersen's Photographic, April 1998

"...flat out impressed with the design and output..."

Editor's Choice
PC Graphics & Video, December 1997

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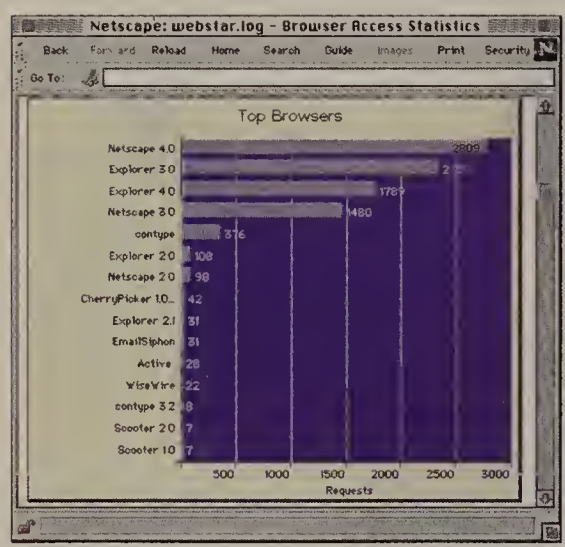
Log-Analysis Software

TOOLS TRACK WEB-SITE USAGE AND VISITORS

WEB SERVERS ARE METICULOUS record keepers. As they dish out content, they also keep track of information that can tell you which parts of your site are the most popular, which platforms and browser versions your visitors use, how your site's traffic varies by time of day and day of week, and much more. But to understand this information, you need specialized software that refines the raw data into detailed reports.



Read It and Reap This graph, generated by Funnel Web, shows a breakdown of the browsers that visited my site in a given period.

Postprocessing programs let you analyze log files that aren't actively tracking hits. I tested two such packages: Kitchen Sink Software's ServerStat 2.0.7 and Active Concepts' Funnel Web Professional 1.7. I also tested two products that specialize in analyzing server logs in real time: Open Door Networks' LogDoor 2.0 and Web Broadcasting's LogFM 1.0.

Postprocessors

Although server logs are text-only files, their format can vary among servers. ServerStat supports logs in WebStar format, the NCSA Common Log Format, and GopherSurfer format; Funnel Web Professional supports these formats and many more. This broader support, and the program's availability on Windows and Unix platforms, makes Funnel Web better for multiplatform shops.

Funnel Web Pro and ServerStat both let you exclude certain types of files and specific folders from the analysis, making the results more meaningful. With ServerStat, you can also filter data based on the type of browser. Funnel Web Pro can track browsers and operating systems, though it can't combine the two sets of stats; it can also report the search keywords surfers used to locate your site.

Funnel Web Pro offers several features you won't find in the program's $199 base version. It lets you track individual visitors to see how many pages they viewed and how much time they spent at your site. If you're serving multiple domains with a single server, you can generate separate reports for each. And you can specify near–real-time monitoring and create updated reports almost continuously.

Funnel Web Pro generates attractive reports whose graphs depict key trends. A single summary page acts as a jumping-off point into detail pages. You can customize headers and footers but not the formatting within each page. ServerStat, on the other hand, generates a single, dense HTML page with no graphs. Although you can create a text-only file and import it into a spreadsheet for graphing or customize the report's HTML formatting, the lack of graphing is a serious limitation.

Instant Statistics

If you can't wait to see how your site is doing and want server statistics in real time, you have two options.

The stand-alone LogDoor, which monitors and analyzes WebStar-compatible log files, is a powerful tool for generating summary reports and slicing and dicing large server logs. Although it can create simple reports, it's not designed to produce the kind of detailed, graph-laden reports Funnel Web creates. LogDoor's strength is its ability to split a large log file into multiple logs, each tracking a specific folder or site. If you're serving multiple sites on a single server, you can use LogDoor to divvy up your server log as a prelude to analyzing each site in more detail.

LogFM comprises a WebStar plug-in that stashes log data in a FileMaker Pro–format database, and an application program that generates thorough but largely textual reports. The program not only compiles summary reports at 24-hour intervals but also offers search features for assessing traffic in real time (though real-time reporting is limited to 3,000 hits per query). You can view LogFM's reports from any Web browser or from the LogFM application.

As impressive as LogFM's capabilities are, they're hampered by some interface flaws, abysmal documentation, and the inability to generate a report based on visitors' platforms.

Macworld's Buying Advice

Of the postprocessing packages we tested, the Funnel Web family is more polished and more capable than ServerStat. Most users will be content with the base version; anyone serving multiple domains will want Funnel Web Professional. As for the real-time packages, LogDoor lacks Funnel Web's reporting options but is an excellent complement to a postprocessing analyzer. Although LogFM shows promise, it needs polishing and better documentation.—JIM HEID

Funnel Web Professional 1.7

RATING: ♦♦♦½ **PROS:** Excellent reporting options; multidomain support. **CONS:** Can't report on browsers by platform. **COMPANY:** Active Concepts (www.activeconcepts.com; U.S. distributor, 805/494-9797). **LIST PRICE:** $399.

LogDoor 2.0

RATING: ♦♦♦½ **PROS:** Powerful log-manipulation features. **CONS:** Limited reporting options. **COMPANY:** Open Door Networks (541/488-4127, www.opendoor.com). **LIST PRICE:** $249.

LogFM 1.0

RATING: ♦♦½ **PROS:** Thorough reports; choice of application- or browser-based viewing. **CONS:** Poor documentation; interface flaws. **COMPANY:** Web Broadcasting (650/329-9676, www.macweb.com). **LIST PRICE:** $395.

ServerStat 2.0.7

RATING: ♦♦♦ **PROS:** Thorough analysis options; customizable; inexpensive. **CONS:** No graphing; no built-in scheduling. **COMPANY:** Kitchen Sink Software (614/891-2111, www.kitchen-sink.com). **LIST PRICE:** $99.95.

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LabView 5.0

WIZARDRY, WEB CONNECTIONS FOR LABS

ARGUABLY ONE OF THE MOST complex pieces of Mac software ever, National Instruments' LabView has no real competition in the area of data acquisition and control of laboratory equipment and instruments. LabView 5.0 expands on the program's original theme of connecting lab instruments and computers, theoretically allowing *all* instruments and *all* computers to be connected via the Web. It's gigantic—a typical installation might involve 200MB of support files and programs in LabView's graphical programming language—but mastering LabView is definitely worth the effort.

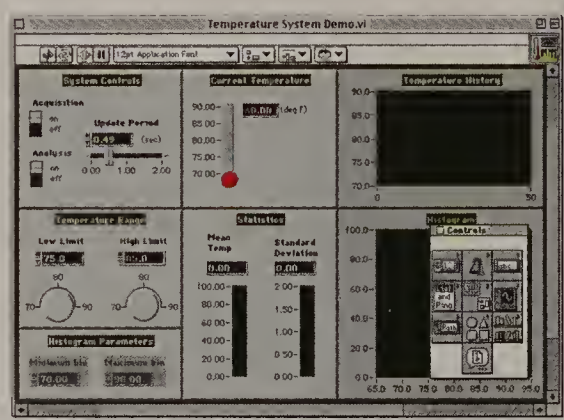
The LabView Picture

From the beginning, LabView has used a virtual-instrument front panel as its interface (see "The View Up Front"); you can wire together a set of icons on screen to make the panels functional. In the first version's diagram-based programming, this meant diagrams with a few simple functions—mostly "virtual components" for operational amplifiers and other familiar lab-electronics components, or complete virtual instruments (standard commercial meters, amplifiers, and scopes) from a library—and most users could put together a basic but usable instrumentation interface in an afternoon. The fundamental concept is simple: once you convert an analog voltage or current into a digital value, the computer can handle any further processing of that value—something that once required lab hardware.

As National Instruments evolved a set of functions and virtual instruments to cover every possible data-analysis situation, two issues arose: the sheer complexity of programs, and the lack of serious debugging and version control in the graphical programming environment.

To resolve the first problem, LabView 5.0 adds three wizards. One wizard leads you through a series of dialog boxes to help you set up the correct data-acquisition protocol; an input-channel wizard mathematically conditions signal inputs, typically converting a voltage to a physical measurement value such as temperature, luminosity, or sound intensity; and an instrument wizard scans your physical input/output connections and installs drivers that let LabView control the instruments attached via standard instrumentation-bus hardware to your Mac. If you're already using LabView, these wizards alone justify the $295 upgrade.

The other issue version 5.0 resolves is the program's previous lack of serious debugging and version control in the graphical programming environment,



The View Up Front LabView lets you create instrument panels on screen and then operate their switches, sliders, and dials with a mouse.

known as G. This environment now makes it easy to identify and report differences among G-language diagrams, a unique facility that really helps on large projects with several contributors.

As a product that could have saved Three Mile Island in its spare time, LabView 5.0 can tackle larger instrumentation and control problems than you'll probably ever face. The downside is that LabView's scope has widened to the point that the program is overkill for data-logging activities in smaller labs with only a few instruments. For those situations, hardware and software from Remote Measurement Systems (www.measure.com) or GW Instruments (www.gwinst.com) would be more appropriate. Note that I am reviewing the complete LabView developer's kit; the $995 base package omits the tools, notably version control, targeted at group programming efforts.

Wired to the World

At its most basic level, LabView 5.0 adapts to the Web's ubiquity by automatically generating documentation for an instrument diagram in HTML. The new version also supports local intranet-distributed computing: specifically, simple code tools let you set up one networked computer as the controller of other computers, which are connected to instrumentation in labs across the network.

LabView 5.0 gives you two ways to monitor and control your equipment from a computer anywhere in the world. One is with automation-server software: from within C, Microsoft Excel, or LabView G-language programs on remote systems, you can make calls to LabView running on a server.

The other method—operating LabView's virtual instruments from within a Web browser—is a little trickier, because LabView is now an ActiveX container, meaning that it can edit and use ActiveX controls (including standard controls for opening Web browsers and passing information). An assortment of ActiveX controls is available from National Instruments, and more are being developed by third parties. This reliance on ActiveX for Web-connection tasks is unfortunate, since few Mac programmers see ActiveX as a better choice than Java for complex jobs. (National Instruments worked closely with Microsoft to develop parts of this package, and ActiveX probably looked like a safe bet at the time.)

The ideal of operating lab equipment, quality-control inspection devices, and safety-monitoring equipment remotely through a Web connection isn't quite here yet, but LabView provides the tools that, with some additional programming effort, can make the ideal a reality.

Macworld's Buying Advice

National Instruments has assembled the most impressive set of data-acquisition and instrument-control software components ever put in a box. LabView is overkill for smaller labs, and its allegiance to the embattled ActiveX causes some Mac difficulties, but Mac users who know a spectrometer from an oscilloscope should check out version 5.0.—CHARLES SEITER

RATING: ♦♦♦♦ **PROS:** Improved graphical programming language; wizards for common tasks. **CONS:** Too large and expensive for simple monitoring. **COMPANY:** National Instruments (512/794-0100, www.natinst.com). **LIST PRICE:** $1,995; upgrade, $295.

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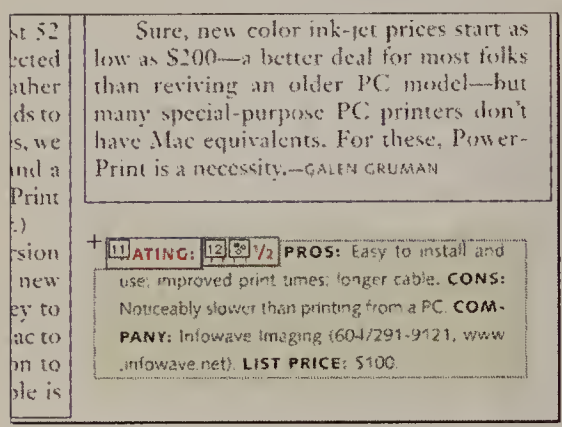
OmniPage Pro 8.0

OCR TITAN'S A GREAT UPGRADE VALUE

LIKE MANY PEOPLE, I HAVE A hard time achieving the ideal of the paperless office. I'm fine if the information is already in my computer, but the swamp of papers crowding my life leaves me feeling, well, swamped. Luckily for folks like me, optical character recognition (OCR) offers a real solution for converting all that paper into usable, storable, and virtually spaceless electronic text documents. The best



Zone of Control OmniPage Pro 8.0 automatically adjusts a zone's borders to prevent overlap (and confusion) with neighboring zones.

of this genre, Caere's OmniPage Pro, saves not only your text but the accompanying graphics as well. It even preserves the appearance of your source document, so you end up with an electronic file that looks like a magazine page, not a single column of 12-point Helvetica text. Its latest version, OmniPage Pro 8.0, makes using OCR easier than ever.

If you've used previous versions of OmniPage, the upgrade's changes aren't immediately obvious; its menu commands and the Auto OCR tool bar look the same as in previous versions. If you look closer, though, you will discover there are exciting improvements.

In the past, you could configure OmniPage Pro to automatically "zone" a scanned document (that is, break down the file into text and graphics, and then again into columns, paragraphs, and other components), or you could do it yourself. For complex documents, it was usually easier to perform this task manually to preserve the look of the original. Not only are OmniPage Pro 8's auto-zoning skills vastly improved from those of previous versions, but it's also much easier to draw zones yourself, due to the new version's ability to account for already-defined components when defining multiple zones (see "Zone of Control").

OmniPage Pro 8.0 also offers better document-straightening features to help you obtain better recognition results, boasts improved recognition of numeric-only pages, and supports colored text. OmniPage Pro now recognizes multiple languages—even when mixed together on the same page—including U.S. and British English, Danish, Dutch, Finnish, French, German, Italian, Norwegian, Portuguese, Spanish, and Swedish. OmniPage Pro made numerous errors in the foreign-language sections of a mixed-language test document, but the previous version of OmniPage wouldn't have recognized foreign languages at all, so you'll have to weigh the benefit to your specific tasks.

OmniPage Pro shows its true strength with less-than-perfect originals. On one test document—an old photocopied flyer printed on orange paper—OmniPage Pro made only three errors while preserving the formatting of the original perfectly.

Caere still hasn't added graphics support to OmniPage Pro's Direct Input feature (which makes OmniPage available under the Apple menu), but plenty of other useful features abound. And Caere makes an enticing offer: if you own any OCR software—a competitor's product, an ancient version of OmniPage, or a limited-version OCR package that came with your scanner—you can upgrade to OmniPage Pro 8.0 for $129, about one-quarter the price of the retail version. With a deal like that, you'd be hard-pressed *not* to crawl out of the paper swamp.

Macworld's Buying Advice

OCR isn't perfect; 100 percent–accurate optical character recognition is still quite a way off. But within the technology's limits, OmniPage Pro 8.0's capabilities are nothing short of amazing, and its competitive-upgrade price makes it a deal that's hard to pass up.—SUZANNE COURTEAU

RATING: ♦♦♦♦ **PROS:** Inexpensive; easy to use; works well on a wide variety of document types. **CONS:** Limited accuracy on foreign languages; no support of graphics via Direct Input feature. **COMPANY:** Caere (408/395-7000, www.caere.com). **LIST PRICE:** $499.

Painter Classic

STREAMLINED PAINT TOOL

WHETHER YOU'RE AN ADOBE Photoshop user, a Web designer, or a traditional artist looking to leap into digital media, MetaCreations hopes to lure you into digital painting with its budget-priced Painter Classic 1.0. Positioned between elementary Art Dabbler 2.1.1 and top-of-the-line Painter 5, Painter Classic offers the same natural-media features that made the original Painter unique, while shielding you from many of its complexities.

Like Art Dabbler (see *Reviews*, April 1998), the $99 Painter Classic is a "lite" version of Painter, but it's much more versatile. While Art Dabbler provides only minimal brush controls, Painter Classic's sliders enable you to set a wide

Make Your Own Palettes You can tear off Painter Classic's tools to create custom palettes, but they're not as useful as they could be.

range of brush sizes, opacity levels, and grain sizes, as well as create multicolor strokes. But to minimize the intimidation factor, MetaCreations stripped out Painter 5's more sophisticated features, such as hidden palettes, layers, mosaics, animation, and color management. Those who decide they're up to the challenge can upgrade to Painter 5 for $199.

Supplementing Painter Classic's built-in natural-media tools are plenty of extras on the CD, including 6 brush libraries, 23 texture libraries, and 25 pattern libraries, as well as 9 Image Hose nozzle libraries for painting with objects.

With a little work, you can create seamless tiles for use as Web-page backgrounds, and Painter Classic lets you save GIFs with transparency. It supports JPEG, EPS, and Photoshop file formats—but although it can export CMYK separa-

tions, it can't even open CMYK files.

As with Painter, you can record and play back painting sessions, plus you can manually clone or autoclone images to add painterly effects to digital photos.

You won't get much out of autocloning, however, if you forget to check the Clone Color box in the Color palette; instead of using the colors in your clone source, the autocloner will paint random brushstrokes (in the designated Primary Color) that bear no resemblance to the original image. An easy fix would be to set the default to Clone Color, since it makes no sense to disable it.

In its zeal to weed out complexity, MetaCreations clearly went too far. Painter Classic's most serious omission is the ability to save customized brushes and tools. Although you're free to modify settings in the Controls palette, your changes vanish as soon as you switch tools; when you go back to the previous tool, its default settings are reinstated. This quickly becomes a nuisance and a big impediment to creative momentum.

Unfortunately, you can't have more than one library of brushes, patterns, textures, or nozzles available at any given time; the built-in brush tools, for example, aren't accessible when you load one of the extra brush libraries. So although I could tear off a tool and add it to my custom palette, it was no longer accessible once I'd switched libraries. Another frustration: the only way to remove tools from a custom palette is to delete the entire palette and rebuild it.

Finally, I didn't find Painter Classic's documentation too helpful: it offered few in-depth answers to my questions.

Macworld's Buying Advice

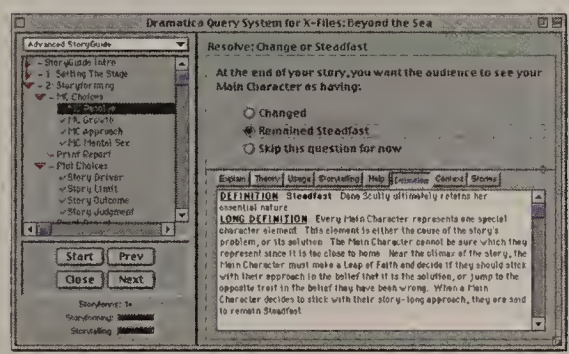
Painter Classic packs a lot of painting punch for the money. But the program could be even better if MetaCreations would fix its irksome interface flaws—that way, you could spend more time creating and less time resetting your tools and palettes.—CATHY ABES

RATING: ♦♦♦ **PROS:** Simplified interface; rich tool set; wide range of settings. **CONS:** You can't save tool settings, have multiple libraries loaded, or remove tools from custom palettes; skimpy documentation. **COMPANY:** MetaCreations (408/430-4000, www.metacreations.com). **LIST PRICE:** $99.

Dramatica Pro 3.0

STORY ANALYZER ADDS LEARNING TOOLS

AIMED AT ASPIRING NOVELISTS and screenwriters, Screenplay Systems' Dramatica Pro is the CAD software of drama: it uses your answers to a series of questions to generate a *storyform*, which is a detailed blueprint for your plot, themes, and characters. It's not as simple as it sounds; before you answer those questions, you have to think about stories in a new way—what the program's authors call the Dramatica Theory. Fortunately, version 3.0 is better organized, offers improved built-in learning aids, and sports useful new tools for building characters and exploring themes.



Drama by Example Dramatica Pro 3.0 uses well-known dramas to help you learn its unique approach to storytelling.

Dramatica Pro sometimes gives you the eerie feeling of an intelligence lurking inside your computer. In reality, it's a database of dramatic elements linked to one another according to rules specified in the Dramatica Theory. You begin with 32,768 possible storyforms, each defining the "deep structure" of the story. For example, *Romeo and Juliet* shares the same structure as *West Side Story*, even though the former is set in Renaissance Italy and the latter in 1950s New York.

As you answer questions about your tale, the number of available storyforms decreases and your choices become more limited. Here's where Dramatica can be a bit vexing: give the program a few tidbits about your main character, and it suddenly tells you that the story should have a negative (or positive) ending.

Some of the questions Dramatica poses are straightforward: Does your main character tend to be active or passive? Will your protagonist change or remain steadfast? Does the story end when time runs out or when options are spent? Other questions involve Dramatica's four *throughlines:* objective character, subjective character, objective story, and subjective story. Each throughline takes place in a certain *domain*—mind, universe, physics, or psychology.

Dramatica Pro assigns its own meanings to such terms, and learning the definitions is one of the challenges of using the program. One useful addition in version 3 is a built-in dictionary that you can organize topically or alphabetically. You can also access definitions with the program's extensive—and vastly improved—query system, which guides you through the storyforming process. And Screenplay Systems' Web site includes the complete Dramatica Theory guide, along with Dramatica-inspired reviews of popular movies to help you get the idea.

Along with improved learning tools, Dramatica Pro 3.0 offers new functions for defining characters. You can quickly add profiles for stereotypical characters, such as bully, introvert, or nerd. New fields in the query system let you define relationships between any pair of characters. Previously, the query system was limited to information about the main and obstacle characters.

The biggest problems with the new version lie outside the software. The package includes minimal printed documentation—just a thin manual, a comic book, and some charts. Version 2.0 included a valuable printed guide to Dramatica Theory that's now available only in electronic form. It's nice to have the guide built-in, but it's best read cover to cover due to the volume and complexity of the material. Finally, unlike previous versions, Dramatica Pro 3.0 is copy-protected; you can install the software only three times.

Macworld's Buying Advice

As unique and engrossing as Dramatica Pro 3.0 is, using it means adopting the Dramatica Theory and climbing a steep learning curve. If you think the theory will work for you, you'll find Dramatica Pro well worth the price.—STEPHEN BEALE

RATING: ♦♦♦♦ **PROS:** Solid integration of story-building functions; strong built-in learning aids. **CONS:** Copy-protected; underlying theory can be difficult; limited printed documentation. **COMPANY:** Screenplay Systems (818/843-6557, www.dramatica.com). **LIST PRICE:** $399.

ComLink 302

BRIDGES THE INK-JET NETWORKING GAP

FOR USERS ON A BUDGET, INK-jet printers are a godsend. For less than $400, you can enjoy near–laser-quality output for pennies a page. But if you subscribe to the "no free lunch" philosophy, you understand that reduced prices require certain sacrifices—one of which is the absence of networking capabilities. In the past, you could bring a rough kind of networking to these printers through the use of serial switchboxes—a solution that often requires the use of special "straight through" serial cables and *always* requires that you remember to flip switches to route different Macs to the printer. Thanks to BH International's ComLink 302, those days are over. For around $40, you can enjoy many of the benefits of networking—no switches, special cables, or software required.

The ComLink's small black box sports four eight-pin mini-DIN ports—one to connect to your printer and three for Mac serial connections. The ComLink includes a standard serial cable, a detachable power supply, and a one-page manual. The top of the box sports two lights—green indicates

KEVIN CANDLAND

that the unit is on, and amber glows when a print job is in progress.

When I tested the ComLink with three Macs—a PowerBook 520c, a Power Mac 6100/66, and a Power Computing PowerTower 180e—hooked to a Canon BJC-4550 and an Apple StyleWriter 2200 printer, pages printed flawlessly. Informal speed tests indicate that the ComLink doesn't interfere with performance, either. Print speeds were comparable whether the Macs were connected directly to the printer or routed through the ComLink.

The ComLink reveals its one weakness when you attempt to print simultaneously from two or more Macs. When several print commands are transmitted at once, the ComLink takes them in the order received. Difficulties arise when one of the Macs tires of waiting for the printer to respond and spits out an error message. As you might expect from such an inexpensive device, the ComLink doesn't carry a memory buffer, nor does it offer a software-based spooling solution. You simply have to wait for the printer to finish its current job and then reissue the print command. For this reason, those using the ComLink to share a printer in a small office should memorize the phrase, "Is anyone else using the printer?"

The current ComLink version allows you to daisy-chain up to four units for a maximum of nine Mac connections. A model slated for March 1999 release—the ComLink 303—will offer an 8MB print buffer, support for both ink-jets and laser printers, and a price still below $50.

Macworld's Buying Advice If you're looking for an inexpensive device for sharing an ink-jet printer among two or three Macs and are willing to negotiate the terms of "who prints when" with your office mates, the ComLink 302 is a solid choice.—CHRISTOPHER BREEN

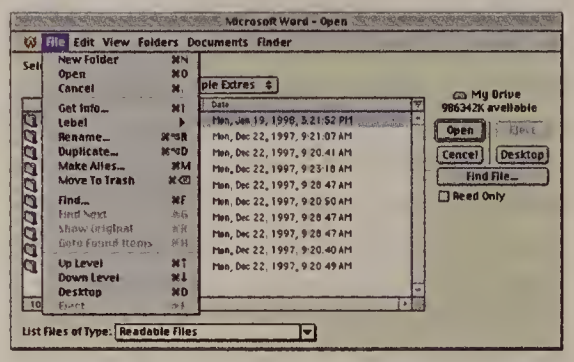
RATING: ♦♦♦♦ **PROS:** Easy to set up; works as advertised; inexpensive. **CONS:** No spooling capability. **COMPANY:** BH International (206/575-0227). **LIST PRICE:** $39.95.

Action Files

BUILD A BETTER DIALOG BOX

DURING THE PAST DECADE, Apple has refined most elements of the Mac OS, but the lowly Open and Save dialog boxes have remained virtually unchanged. They offer no search or sort functions, nor do they list recently accessed documents or folders. Super Boomerang, a component of Now Software's Now Utilities (still incompatible with Mac OS 8 as of press time), provided some relief for folks desiring such enhancements, but many users found later versions unstable. Thankfully, an OS 8–compatible, feature-rich, *and* stable alternative has arrived—Power On Software's Action Files 1.0.

Action Files serves up simple yet very handy functions. It appends a hierarchical menu to both the Open command and the Save As command in the File menu, listing favorite and recently accessed files and folders. In the Action Files control panel you can change default display settings, such as the maximum number of files and folders you want in the menu, and choose which applications you *don't* want to have Action Files' functionality; applications with their



Get Into the Action Power On Software's Action Files lets you perform Finder-like functions without exiting a dialog box.

own hierarchical menus, such as QuarkXPress and Microsoft Excel, don't handle Action Files' menus properly.

But Action Files' real power is in how it beefs up the functionality of your Open, Save, and Save As dialog boxes—which you can now resize. It adds a menu bar that offers many of the same operations as the OS 8 Finder menu bar. For example, without exiting the dialog box, you can create new folders; move items to the Trash; use the Get Info command for files and folders; and label, rename, duplicate, or make an alias of an item. You can perform these actions on only one file at a time, though.

You can use Action Files' View menu to sort items in the dialog box by criteria such as name, size, kind, label, and date; or you can sort by clicking on the corresponding column heading in the list. And you can select recent files and folders via the Folders and Documents menus.

Action Files also sports a Find command that far surpasses Super Boomerang's limited search function. It's modeled on Apple's Find File application and allows you to search by nearly all the same criteria as in Find File. Regrettably, Action Files' search fields don't support Macintosh drag and drop; unlike with Find File, if you choose to search by creator you can't drag and drop a file into Action Files' search field and expect that file's creator to appear in the field.

Macworld's Buying Advice Apple should consider folding Action Files 1.0's features into a future release of the Mac OS—they're that good. If you'd like your Open and Save dialog boxes to be as option-packed as the OS 8 Finder, you're ready for Action.—CHRISTOPHER BREEN

RATING: ♦♦♦♦ **PROS:** Adds handy Finder-like functionality to Open, Save, and Save As dialog boxes; compatible with OS 8. **CONS:** Find feature doesn't support drag and drop. **COMPANY:** Power On Software (612/317-0344, www.actionutilities.com). **LIST PRICE:** $50.

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Painter 3D

PAINT TEXTURES ONTO 3-D MODELS

AN INDISPENSABLE CAPABILITY for 3-D modelers and animators is being able to paint textures, highlights, reflections, glows, and environment maps directly onto 3-D objects in real time. Fractal Design's Detailer made this a reality, and when MetaCreations acquired Fractal, it revamped Detailer with goodies stolen from MetaCreations' own high-end digital-painting program, Painter, and named the new program Painter 3D. But although Painter 3D's interface changes, rich tool set, and well-implemented functions add up to a program with incredible imaging power, the program's weak native support for most 3-D packages makes Painter 3D less convenient for many users.

Painter 3D looks a lot like Painter: it includes almost all of the same palettes and tools—including Painter 5's new plug-in floater tools—but it also has the same cumbersome implementation, which can be daunting for new users.

The new Objects palette makes it much easier to manage complex 3-D models you import into Painter 3D: it shows the hierarchy of the parts of your 3-D model and lets you easily select and hide separate pieces. The new Images palette lets you easily see which maps are assigned to which objects in your scene, and it lets you lock and hide maps.

Crazy for Palettes Painter 3D's Maps and Objects palettes help reduce some screen clutter, but the program's tool collection is still unwieldy.

Other mapping improvements include the ability to assign one map to several different objects. And to help you decide what size map to use, Painter 3D now offers a Minimal Distortion option, which automatically calculates and recommends an aspect ratio for every map you create.

Another much-needed new feature is the set of Normals controls, which lets you smooth, repair, and invert polygon normals that were incorrectly imported. Such polygon normals can make models appear to have holes.

Despite all its painting power, Painter 3D preserves one of the weaknesses of Detailer: the inability to save textured models in several different 3-D file formats. If you're using a 3-D program other than MetaCreations' Ray Dream Designer, you'll have to save all of your maps as TIFF files and reposition them by hand in your 3-D program of choice.

Macworld's Buying Advice MetaCreations has done a good job of improving an already powerful product—but using Painter 3D's texture maps in any application other than Ray Dream Designer can be a hassle. Native support for more 3-D programs would help Painter 3D become the professional tool it could be. Still, for painting texture maps directly onto 3-D models, there's no tool on the market that comes close to Painter 3D.—BEN LONG

RATING: ♦♦♦♦ **PROS:** Great painting tools; easy model and texture management. **CONS:** Can't export native formats for most 3-D packages; cumbersome interface. **COMPANY:** MetaCreations (805/566-6200, www.metacreations.com). **LIST PRICE:** $449; upgrade from Detailer, $149.

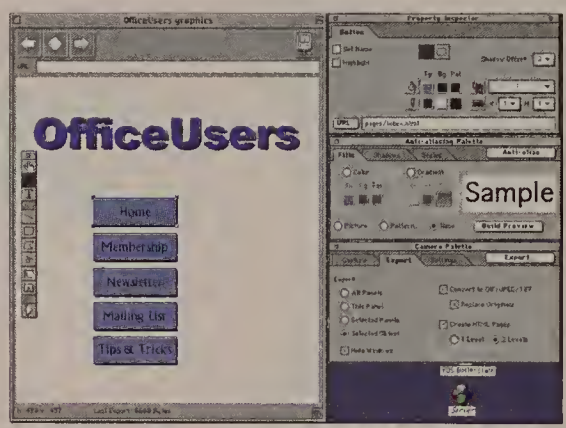
webAlias 1.1

EASY ANTIALIASED TEXT FOR THE WEB

ON A WEB PAGE, NOTHING SHOUTS "amateur!" quite so loudly as GIF text that's not antialiased; jagged graphics are an invitation for visitors to leave your site. But creating attractive antialiased text has typically required expensive programs like Adobe Photoshop. Lakewood Software's new webAlias 1.1 creates good-looking antialiased text and image maps at a price that won't make your wallet scream.

webAlias starts you out in a project window containing a master background page and any number of document pages. Simple drawing tools let you create both graphic objects—lines, rectangles, polygons, text fields, and buttons—and hot spots for image maps. While you can use those tools to create a navigational button bar, it would be easier if webAlias let you duplicate and repeat objects or align multiple objects.

The program gives you great control over the look of your text, including font, style, color, alignment, and leading. You can condense and extend text, although you can't control kerning. You can also create text effects, such as large display text filled with pictures, patterns, or gradient fills, and customize your drop shadows. Conveniently, you can define and save custom text styles and text effects.



Pro Aliasing In webAlias, it's a snap to create a headline and apply a drop shadow. This button bar was created entirely within webAlias; the button labels are also antialiased.

webAlias outputs client-side image maps and creates HTML pages that reference them. You can assign a URL to each object you create in webAlias. But because webAlias is designed to work with other Web-page editors, you can't add extra HTML within the program; you have to take the snippets of code webAlias produces and add them to your pages using an HTML editor.

One drawback of webAlias's approach is that it creates images in PICT format, and then uses the scriptable freeware program Clip2gif to convert the images into GIF or JPEG format. Because webAlias doesn't handle the whole process itself, it can't show you a preview of your images at various quality settings as the upcoming Macromedia FireWorks will.

Macworld's Buying Advice Lakewood Software claims that you can use webAlias to create entire Web sites. That's true in theory; just be aware that each page will consist of one giant image map. In practice, you're better off using webAlias to whip out antialiased text, simple buttons, and graphics and to convert existing graphics to image maps. For Web builders who don't want to spend big bucks or climb the learning curve for Photoshop or FireWorks, webAlias's antialiasing text tools alone are worth the price.—TOM NEGRINO

RATING: ♦♦♦½ **PROS:** Inexpensive; easy to use; good text antialiasing. **CONS:** No kerning controls; relies on external program for GIF and JPEG conversions; duplication and alignment tools need improvement. **COMPANY:** Lakewood Software (416/614-7794, www.lakewoodsoftware.com). **LIST PRICE:** $39.95.

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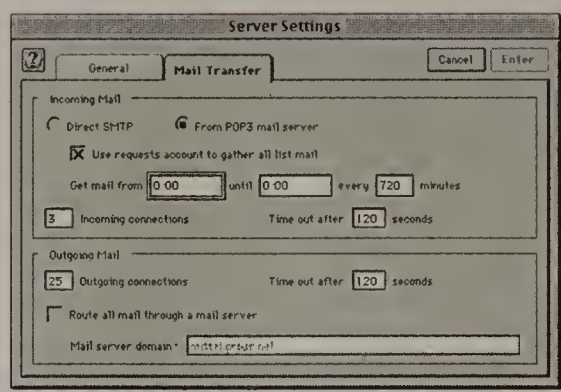
LetterRip Pro 3.0

MAC LIST SERVER GETS EVEN BETTER

E-MAIL LISTS HAVE BECOME ONE of the most useful services on the Net. Unfortunately, many people who'd like to run a list of their own don't want to wrestle with the vagaries of list servers, which typically run on Unix boxes and sport administration interfaces most charitably described as byzantine. Many users are also stuck with the services their ISPs provide, which don't always include list hosting. LetterRip Pro 3.0, Fog City Software's Mac-based list server, is both robust enough to handle large, high-volume lists and convenient enough that you'll want to use it even for tiny lists.

LetterRip Pro consists of two applications: a server and an administrator. The server software has no user interface to speak of; all the interaction happens in the Admin application, where you create and manage the lists. Once the basic setup is complete, further management takes place within Admin or one of the included *processors*, add-on programs that extend LetterRip's capabilities. The supplied processors will meet the needs of typical users, but you can also create your own using AppleScript.



Make a List LetterRip Pro 3.0 sports a clean interface for managing a server and individual lists.

Another concern with most list servers is that they need full-time Internet connections. LetterRip can be a full-time list server or retrieve list mail at intervals via POP, the way conventional e-mail clients do. Because version 3.0 lets you funnel lists through a single POP account, you don't have to create a separate account for each list.

Besides offering the standard list-serving features, version 3.0 pays attention to the details, such as fuzzy address matching when subscribing and unsubscribing (resulting in less hassle for list subscribers and administrators alike) and the ability to designate list-specific administrators on LetterRip servers hosting multiple lists.

LetterRip Pro 3.0 is also one of the first Mac server programs to take advantage of Open Transport 1.3's multihoming features, meaning that the package can—in theory—run on the same Mac as a conventional mail-server program while using a different IP address. Unfortunately, none of the popular Mac-based mail-server applications support this new OT feature.

Despite its polish, LetterRip Pro 3.0 isn't perfect. Its most glaring omission is the lack of even rudimentary automated bounce management (for deleting invalid e-mail addresses). And despite LetterRip's high degree of configurability, some features that should be configurable—such as the daily bounce digest's 1 a.m. sending time—aren't.

Macworld's Buying Advice No product can make list-server management completely nontechnical, but LetterRip Pro 3.0 comes close; it has plenty of horsepower to handle lots of list traffic yet is easy to set up and maintain. If you need to host e-mail lists, LetterRip is clearly one of the best solutions on *any* platform.—STEPHAN SOMOGYI

RATING: ♦♦♦♦ **PROS:** Great performance; easily handles large and small lists; extensible; supports multihoming. **CONS:** Minimal bounce handling; lacks some configuration options. **COMPANY:** Fog City Software (408/454-1405, www.fogcity.com). **LIST PRICE:** $395.

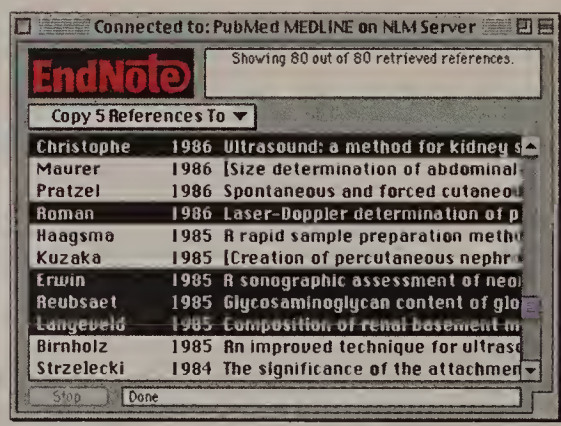
EndNote 3.0

INDISPENSABLE BIBLIOGRAPHY MANAGER

OVER THE YEARS, I'VE PROBABLY saved hundreds of hours by using EndNote to format citations and bibliographies in my research papers and books. With version 3.0, Niles Software has managed to make an indispensable tool even more powerful by letting you access Internet- or intranet-based databases from within EndNote.

EndNote's search feature works with dial-up or direct connections and is compatible with any database server that follows the Z39.50 standard—for example, MedLine, the Library of Congress, and research databases at colleges and universities. You'll need a unique connection file for each remote database you want to access; EndNote ships with preconfigured files for more than 100 databases, and you can download new ones free from Niles's Web site. (The manual even gives detailed instructions on how to edit connection files and create new ones.) If the database is restricted to subscribers, you'll be prompted to enter a user ID and, if necessary, a password.

Once you're online, you can use EndNote's standard search engine to look for



Remote Search You can easily transfer any subset of retrieved references into an EndNote library.

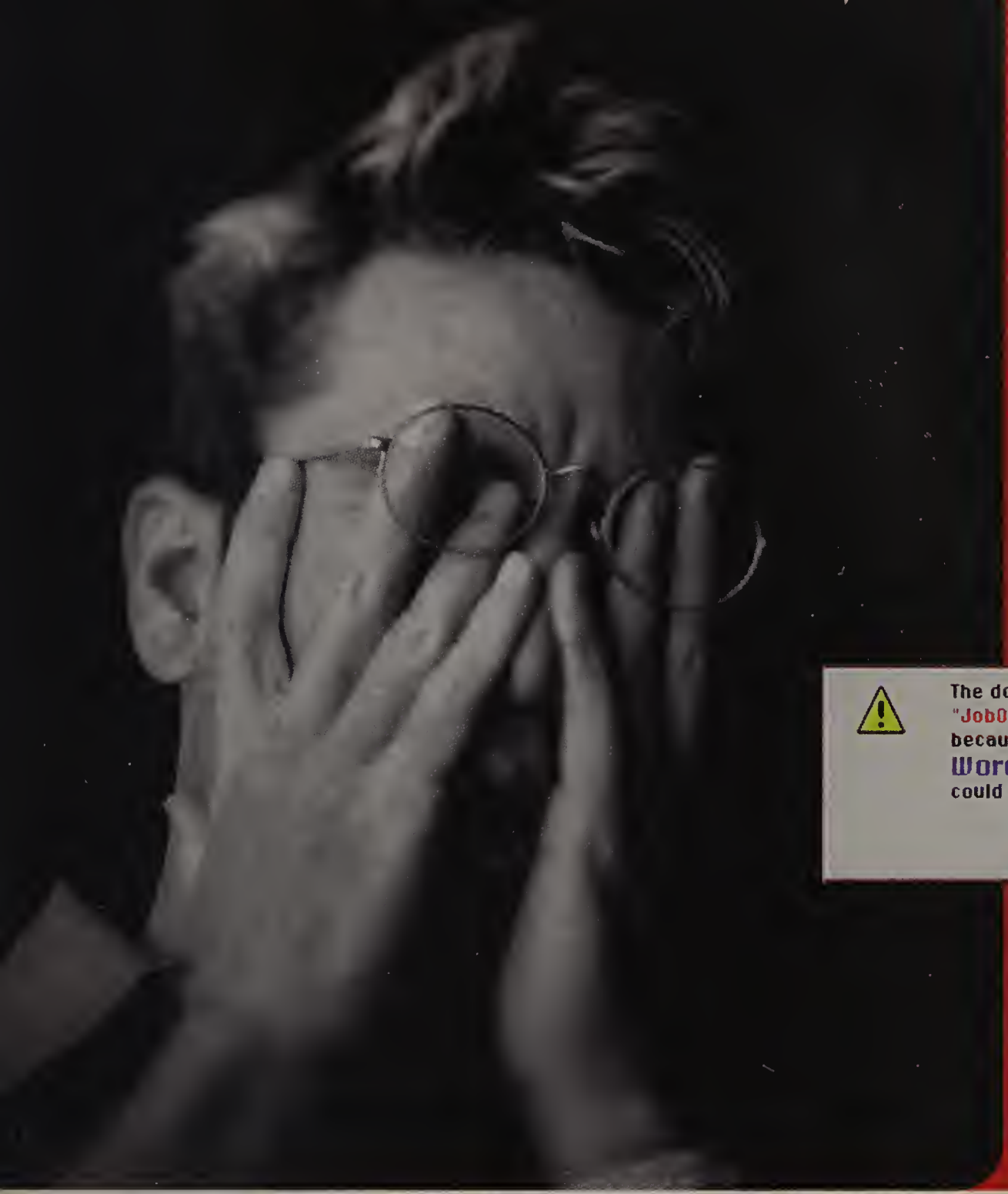
references. EndNote displays a dialog box showing how many matching records were found, so you can retrieve as few or as many references as you like. Depending on the number of records and the speed of your connection, it may take a few minutes to capture them all. When you're finished, you can transfer the references into an EndNote library with one mouse-click.

In some cases, EndNote's search options aren't as comprehensive as those offered by a database's provider. For example, you can access the MedLine database on the Web at no charge by using a front end that lets you look for references based on an author's institutional affiliation; that option isn't available when you use EndNote to search the same database. But EndNote's engine is adequate for many searches, and it's especially valuable when you need to find only a reference or two.

For databases that aren't accessible online, EndNote 3.0 still lets you import references that have been saved in text files—unlike the previous version, EndNote 3.0 no longer requires the separate EndLink to import references. The new release also sports several other improvements, including compatibility with ClarisWorks, support for drag-and-drop transferring of references among libraries, and a plug-in for Microsoft Word 6 and Word 98. (An EndNote 3.0 plug-in for Microsoft Word 5.1 should be available by the time you read this.)

Macworld's Buying Advice If you're already an EndNote user and you work with remote databases, the $99.95 upgrade is a worthwhile investment. If you're still formatting research papers the old-fashioned way, EndNote deserves a prominent place in your software tool kit.—FRANKLIN TESSLER

RATING: ♦♦♦♦ **PROS:** Searches remote databases; can import references. **CONS:** Search options not always comprehensive. **COMPANY:** Niles Software (510/559-8592, www.niles.com). **LIST PRICE:** $299.



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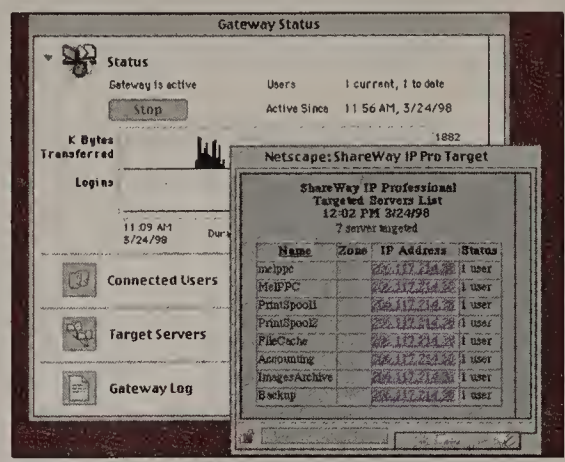
ShareWay IP Professional 1.1

APPLETALK/IP GATEWAY BRINGS IP TO APPLESHARE FILE SERVERS

ALTHOUGH APPLE'S APPLESHARE IP 5.0 lets high-end Mac OS AppleShare servers run over TCP/IP networks, it does nothing for Personal File Sharing (PFS) on a Mac or AppleShare Filing Protocol (AFP) on a platform other than the Mac. Open Door's ShareWay IP Professional 1.1 can help get these low-end AppleShare servers online with TCP/IP. Running on a single gateway Mac, ShareWay IP acts as a TCP/IP switching station for any number of AFP servers. It transfers data faster than AppleTalk, and it runs over the Internet—a boon to anyone needing remote file access.

ShareWay IP Pro consists of the gateway application, the latest Apple Chooser and AppleShare Client extensions, HTML-formatted documentation, and a Web-browser helper application that makes it easier for users to connect to AFP servers over TCP/IP. (Standard and Personal editions target a single server or one user's PFS server, respectively.) To configure ShareWay IP, you simply launch the gateway app and select the local AFP servers you want to share over TCP/IP. Client Macs then use the updated Chooser extension to attach to a server.



Web-Based Selection ShareWay IP Professional lets users connect to remote AFP servers over TCP/IP simply by clicking on a Web page's hot links.

Selecting a server in the Chooser isn't as easy as with traditional AFP servers: because the normal AppleShare server-discovery process doesn't work over TCP/IP, users must type in the IP address or Internet name of the desired server. ShareWay IP offers an ingenious solution to this problem. After setting up the gateway, you can export an HTML document listing the target servers and use Apple's Personal Web Serving to serve the HTML document on your intranet. Users access this list via a browser and click on the server they want to access; a helper application then connects to the selected server without going through the Chooser.

ShareWay IP performs well compared with traditional AppleShare, offering somewhat improved performance even when running over a TCP/IP router. Handy logging and performance-graphing tools let you monitor individual servers. ShareWay IP's only shortcoming is its lack of security features; you can't limit access to certain IP addresses, for example.

Macworld's Buying Advice ShareWay IP Pro improves file-server performance and lets you make existing AFP servers accessible to TCP/IP users worldwide with an elegant Web-based server-selection tool. It's the easiest way to survive the new TCP/IP world order.—MEL BECKMAN

RATING: ♦♦♦♦ **PROS:** Easy to set up; supports multiple servers; excellent performance; Web-based server selection. **CONS:** Lacks TCP/IP-oriented security features. **COMPANY:** Open Door Networks (541/488-4127, www.opendoor.com). **LIST PRICE:** Professional Edition, $479; Standard Edition, $249; Personal Edition, $79.

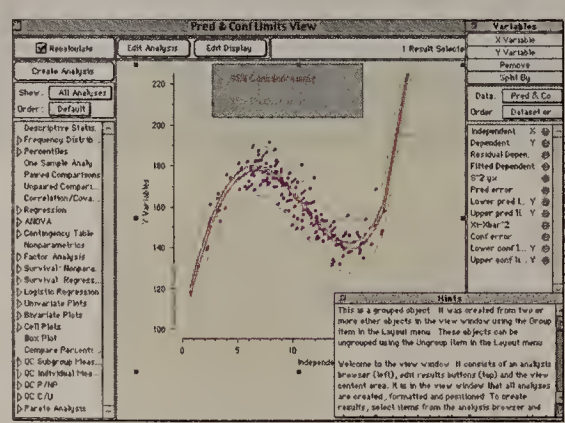
StatView 5.0

STATISTICS BY TEMPLATE

ONE OF THE OLDEST SURVIVING Macintosh applications, StatView proves that a long evolution can produce a superior species. Version 5.0, now part of SAS Institute's product line, is positioned as the easiest statistics package for nonspecialists—and that's exactly what it is.

StatView's approach has always been to offer statistical tests more or less as they appear in standard textbooks, using ready-made templates instead of user-written programs. SAS has filled out StatView's test list with small and large additions. The program now offers nonlinear-regression templates; you could analyze nonlinear regression in earlier versions by transforming variable sets, but in version 5.0 it's all automatic. A major new set of tests deals with logistic regression, a specialty in some areas of economics and business. And the program can now handle models at Census Department levels of complexity.

SAS has supplemented StatView's already excellent ANOVA test suite with the last few missing bits, more-detailed control over interactions, and actual and predicted classification tables for summaries. StatView has always been oriented toward the statistics most useful in biomedical studies, and version 5.0 includes tests that cover all the stats you're likely to see in a research journal in *any* application area. Another plus: StatView now imports and exports Microsoft Excel and Word files flawlessly, and data sets can be exchanged between Mac and Windows versions with no glitches.



Plot Your Data, Stat StatView 5.0 lets you import data from a Microsoft Word file and generate a plot with just two or three mouse-clicks.

What sets StatView apart from other stats programs is the minimal effort it requires to convert data sets into high-impact statistical reports and graphics. If you've collected quality-control data, for example, you can get publication-ready charts by making a few simple selections. In sharp contrast to other statistical-graphics tools, you can enhance the chart's details with a few points and clicks.

StatView's ability to make reporting and analysis as easy as pushing a button conceals one potential problem for beginners: the program can generate authoritative-looking pages of nonsense if you don't know which test to select. Fortunately, the documentation and support are excellent.

StatView's lack of programmability would be a drawback if StatView weren't targeted at those who prefer to get attractive standard-test output in a hurry rather than program new types of analyses from scratch. Newer, computer-intensive stats methods get left out this way, but typical StatView customers won't fret.

Macworld's Buying Advice StatView is the best choice for nonstatisticians, and SAS has produced a valuable upgrade in version 5.0. If you've got more data than you have stats background, it's the answer to your prayers.—CHARLES SEITER

RATING: ♦♦♦½ **PROS:** Complete set of tests; templates with high-impact output. **CONS:** Wrong test choice generates equally impressive-looking results. **COMPANY:** SAS Institute (415/623-2032, www.statview.com). **LIST PRICE:** $695.

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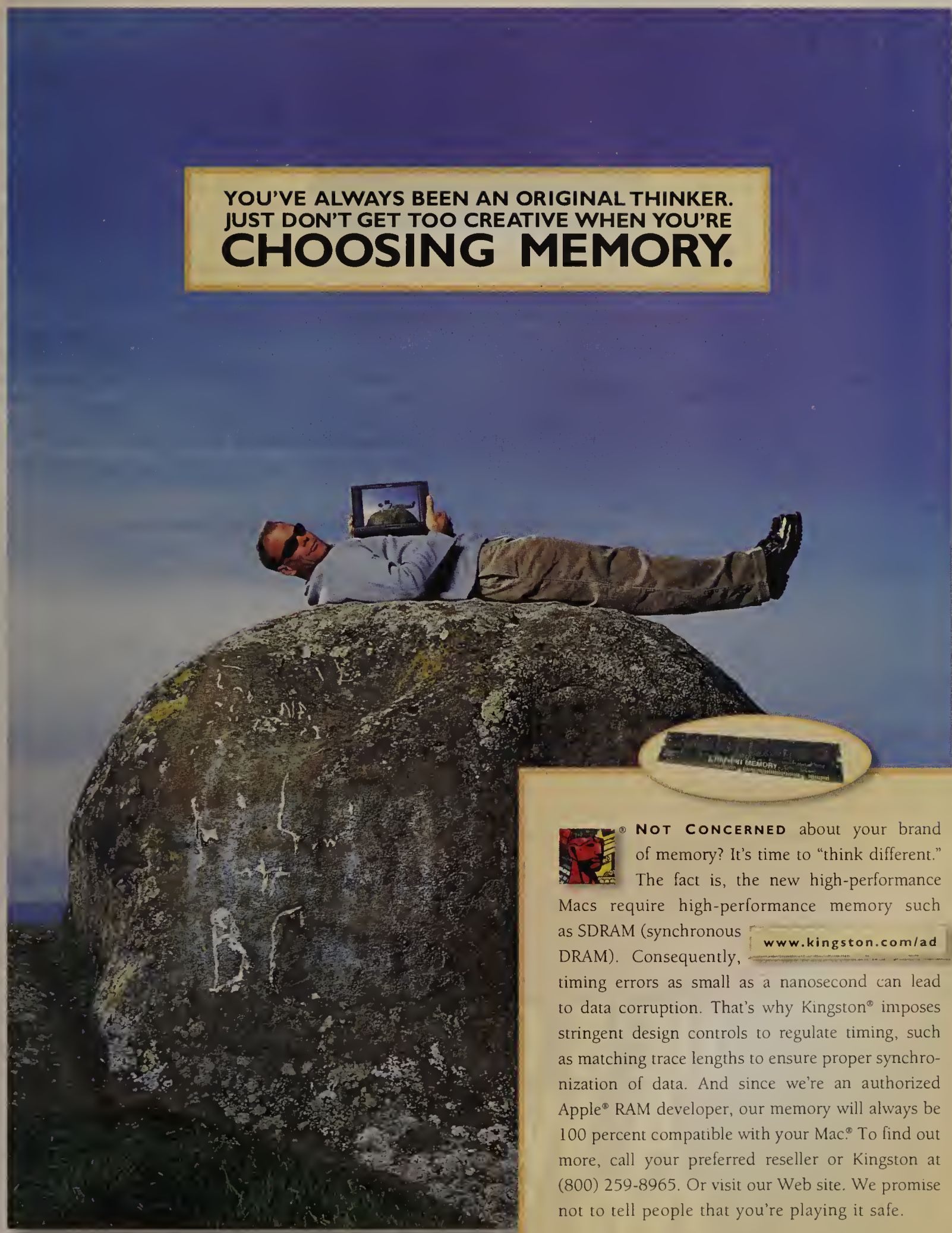

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MetaSynth 2.0

TURN GRAPHICS INTO SOUND

SOMEWHERE OUTSIDE THE WELL-established genres in the audio world—MIDI sequencers, sampled-sound editors, and musical-notation programs—lies Arboretum Systems' MetaSynth 2.0. At its most basic level, this outrageous program lets you take any graphic image and "convert" it into sound. The Macintosh-only MetaSynth is not only guaranteed to enrapture music pros but is also yet another reason to consider the Mac the premier audio-creation tool.

MetaSynth uses an image's brightness and color information to generate musical notes. You can change how the image "sounds" with a variety of built-in filters (softening, sharpening, and more); painting tools let you draw within MetaSynth. The program's many methods for converting images to sounds allow amazingly sophisticated special effects. For example, a pixel's color determines the pixel's position in the stereo sound field (red is panned hard right, green hard left, yellow exactly in the middle).

MetaSynth's range of special effects and tools for manipulating images is so extensive that we can only scratch the surface here. The incredible real-time basic waveform and procedural wave-table synthesizers are a virtual tutorial in sound generation: as you drag the wave shape around, you hear the effects of your actions in real time. You can use the resulting synthesized sound to control the audio generated by the visual image-processor. And then there are the real-time special effects, including a reverb that you manipulate using a mouse.

Turn Down Those Pixels! MetaSynth's interface takes over your screen with layers of overlapping function windows. Here, the Image Synth window displays graphics data to be converted into sound; the resulting waveforms appear in the background.

While MetaSynth lacks MIDI support of any kind, it can output mono or stereo AIFF or Sound Designer II files that you can then bring into a MIDI sequencer or other audio-editing program (such as Digidesign's Pro Tools). You can also open AIFF and Sound Designer II files in MetaSynth and apply dynamic processing effects and basic sample-editing functions. For example, you can synthesize a robotlike voice by importing a previously sampled human voice and using it to modulate a sound effect created in MetaSynth.

MetaSynth's negatives are few: a small bug in the Undo function, documentation that could be more extensive and better organized, and an interface that sometimes strays from Macintosh conventions.

Macworld's Buying Advice If you're an audio enthusiast, you'll find yourself losing vast amounts of sleep exploring MetaSynth's endless sonic delights. Regardless of your level of audio expertise, MetaSynth will help you hear the intricacies of sound and motivate you to learn more about audio design. There's nothing else out there like it.—DAVID BIEDNY

RATING: ♦♦♦♦½ **PROS:** Unique image-to-sound conversion; real-time effects processing; limitless sound-design possibilities. **CONS:** Bug in Undo function; documentation needs work; non-standard interface. **COMPANY:** Arboretum Systems (650/738-4750, www.arboretum.com). **LIST PRICE:** $249.

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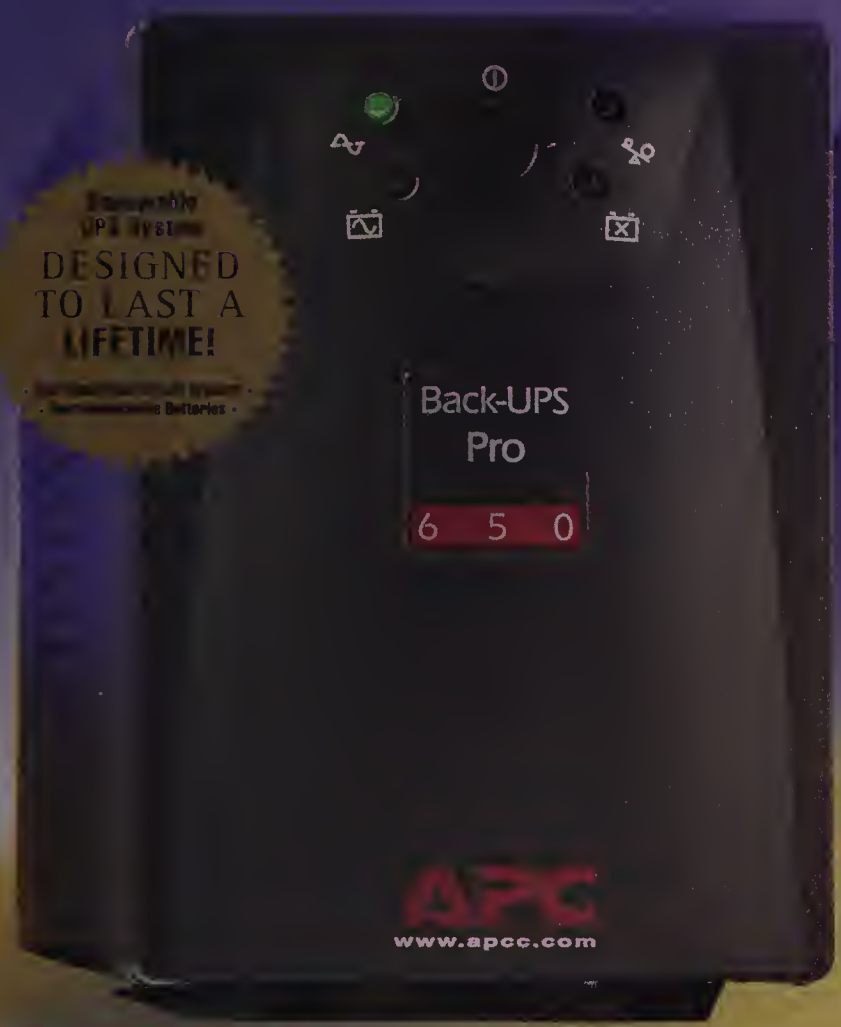

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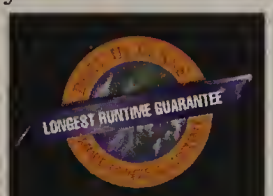

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X-Men: The Ravages of Apocalypse

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MY FAVORITE X-MEN WERE always the tough, acrobatic Beast and the rebellious Wolverine, with his supercool extensible claws. But after playing X-Men: The Ravages of Apocalypse—starring those beloved mutant superheroes—I pined for Professor Xavier, the coolheaded leader who brought balance to the others' raw fury.

A conversion of MacSoft's Quake (see "Great Games," January 1998), Ravages uses the original's engine but replaces everything else with pieces from Marvel Comics' X-Men universe, including an unbelievably convoluted story line. Suffice it to say that the X-Men's archenemy Apocalypse seeks world domination and has assembled an army of cloned X-Men. You're a cyborg, built to infiltrate Apocalypse's base and thwart his plans.

Graphically, Ravages offers a confusing mixture of improvements and disappointments. Its environments feel like those in a Marvel comic book, but its simplistic levels lack Quake's grand space and nightmarish claustrophobia. The characters, though, are spectacular. Each X-clone is easily recognizable even from a distance, complete with unique movements, weaponry, and tactics. Beast is particularly believable, tumbling and bouncing like a blue rubber ball, pausing only to thump you or pound the ground.

Slice and Dice If you're used to zombies, droids, and other easy fodder, you're in for a surprise from Wolverine's razor-sharp claws.

Of course, you could hardly expect to dispatch such wonderfully crafted enemies with a single blast. If you're used to wading through waves of corpses, you're in for a shock. These X-clones are *tough*, and their weapons pack a devastating wallop; expect extended battles with foes that absorb astonishing amounts of punishment.

In theory, Ravages' emphasis on tactics over firepower forces you to learn to maneuver rather than merely take aim. In practice, though, the game needs more polish. Even the easiest setting features multiple, nasty enemies and long stretches between health power-ups. Experts may find this challenging, but most players will just be frustrated. And Ravages makes the mistake of unveiling most of its characters and weaponry in the first two levels, leaving little suspense for later.

I had great hopes for multiplayer action—where you assume the X-Men's powers—but encountered endless troubles setting up games and getting the server and clients to talk to each other. And after all that effort, the head-to-head matches were boring.

Macworld's Buying Advice If you already own Quake and you're itching for more, you'll enjoy X-Men: The Ravages of Apocalypse. But if you don't already own Quake, don't rush out to buy it simply for the sake of this conversion.—CAMERON CROTTY

RATING: ♦♦♦ **PROS:** Characters faithfully reproduced; good comic-book feel. **CONS:** Unbalanced game play; frustrating for most players. **COMPANY:** MacSoft (612/509-7600, www.wizworks.com/macsoft/). **LIST PRICE:** $24.99.

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G3 UPGRADE CARDS CAN TAKE YOUR OLD MAC TO NEW HEIGHTS

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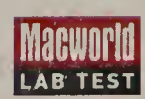


by Cameron Crotty

EVERYTHING I REALLY NEEDED TO KNOW ABOUT upgrades, I learned from Wile E. Coyote, Esq. Faced with the task of catching the supernaturally fast Road Runner, the coyote depended on his magical Acme mail-order catalog for everything from propeller beanies to spring-loaded shoes. Hardly an episode passed without old Wile E. riding jet-powered skates across desert rock formations like an out-of-control roller-coaster car. Now that I'm a grown-up, I know you can't really tie rockets to roller skates and get feasible transportation as a result. However, a modest investment in a CPU upgrade card *does* seem to buy something like Acme's patented super-speed pill for your old Mac.

Thanks to the PowerPC G3 chip, upgrade cards are astonishingly powerful and are less expensive than they've ever been before. But do the benefits of upgrading outweigh the advantages of buying a brand-new machine? We tested the latest pack of upgrade cards and found that the answer varies. Like Wile E. Coyote's

best gadgets, upgrade cards may send you zooming through the skies, but it's just as easy to smack into a cliff if you don't know what you're getting into.

ROCKETS FOR THE REST OF US

For many years, upgrading was the game of performance hounds intent on chasing down a 10 or 15 percent speed boost no matter what the cost. Meanwhile, most civilians simply bought new computers. After all, a brand-new Mac often sold for just a few hundred dollars more than an upgrade card; offered better performance; and came with extra goodies such as a large new hard drive, RAM galore, and a fast CD-ROM drive.

UPGRADING ISN'T JUST ABOUT 10 PERCENT SPEED BOOSTS ANYMORE—IN SOME CASES IT'S ABOUT MORE THAN 100 PERCENT IMPROVEMENT

But things are different now. The new PowerPC G3—also known as the PowerPC 750—is the first CPU, or processor, engineered specifically to complement the strengths (and make allowances for the limitations) of the Mac OS. Earlier PowerPC chips provided modest performance gains from generation to generation, but now even systems based on the slowest PowerPC G3 are twice as fast as systems based on the fastest PowerPC 604, just one generation older. What this means is that upgrading isn't just about 10 percent speed boosts anymore—in some cases it's about more than 100 percent improvement.

Better still, an engineering decision Apple made a few years ago has also helped make the upgrade cards cheaper than ever. Beginning with the Power Macintosh 7500 and 8500, Apple placed the processor and clock chip together on an independent card, instead of soldering them onto the motherboard as in previous designs. For the first time, the processor could be popped out and replaced, instead of requiring complex—and *expensive*—engineering workarounds. The upgrade cards we tested often doubled performance and ranged from just $500 to $2,200.

Nevertheless, buying an upgrade card still isn't a total no-brainer. Prices have dropped, but the fastest upgrade cards don't cost much less than a brand-new Power Mac G3/266 complete with a fresh load of RAM, a fat hard drive, a faster system-bus speed, and new hardware technology (from Zip drives and DVD-ROM kits to cutting-edge interfaces such as FireWire; *Macworld* evaluates a high-end Power Macintosh G3/300 in *Reviews*, this issue). In other words, buying an upgrade card instead of a new computer is always a trade-off.

Individual situations will vary, but generally speaking, we found that there are three types of users who will ben-

Upgrade Cards Compared

Company	Product	Mouse Rating	List Price	Phone	CPU Speed	Cache Size
Mactell	PowerJolt G3 266MHz	½	$1,695	512/323-6000	266MHz	1MB
	PowerJolt G3 300MHz	½	$1,995	512/323-6000	300MHz	1MB
Newer Technology	Maxpowr G3 220/110	½	$699	316/943-0222	220MHz	512K
	Maxpowr G3 250/125	½	$799	316/943-0222	250MHz	512K
	Maxpowr G3 266/133	½	$1,049	316/943-0222	266MHz	1MB
	EDITORS' CHOICE					
	Maxpowr G3 275/183		$1,299	316/943-0222	275MHz	1MB
	Maxpowr G3 300/300		$2,199	316/943-0222	300MHz	1MB
PowerLogix	PowerForce G3 275		NA *	512/795-2978	275MHz	1MB
	PowerForce G3 275		NA *	512/795-2978	275MHz	1MB
Sonnet Technologies	EDITORS' CHOICE					
	Crescendo G3 233MHz	½	$499	714/261-2800	233MHz	512K
	Crescendo G3 266MHz		$799	714/261-2800	266MHz	1MB
	Crescendo G3 300MHz		$1,099	714/261-2800	300MHz	1MB
XLR8	Mach Speed G3 266MHz	½	$1,289	316/636-5544	266MHz	1MB
	Mach Speed G3 275MHz	½	$1,399	316/636-5544	275MHz	1MB
	Mach Speed G3 300MHz	½	$1,999	316/636-5544	300MHz	1MB

NA = not applicable. * At press time, manufacturer informed *Macworld* that this model will be discontinued and replaced with a faster card.

efit most from CPU upgrades:

The Heavily Equipped Do you have more money invested in RAM, add-on cards, and extra storage than in your Macintosh itself? Have you filled your every port, slot, and bay? Is your system so complex that it's on the verge of becoming sentient? If so, a CPU upgrade can save you the hassle of transferring all your add-ons or, even better, the substantial expense of replacing them.

Owners of NuBus-based systems (the Power Mac 6100, 7100, and 8100) may find this solution particularly attractive, because moving to a PCI-based Mac may require the added expense of acquiring a PCI-to-NuBus expansion box or a completely new set of PCI boards to replace your NuBus cards. Several companies are working on upgrade cards for those machines but, unfortunately, were not finished in time for this article. Early test results look promising, though, and we'll follow up with reviews in upcoming issues. One caveat: Before you run out and buy a shiny new G3 upgrade card for your NuBus-based Mac, be aware that some upgrade cards can obstruct NuBus slots.

The Wary It's time to get a new Macintosh, but you're uneasy about Apple's future. You don't want to buy a Windows-based PC—although your CIO might—and neither of you is ready to drop $25,000 on several brand-new Macs for your workgroup. If this describes you, then upgrade cards may be your best bet. They offer a substantial speed boost while preserving the time, money, and training you've invested in your current Macs. The fact is, upgrade cards could be just the clever, fiscally prudent suggestion that will convince your cost-conscious boss not to get rid of your Macs.

The Thrifty That Macintosh sitting on your desk at home has been around for years, and even though it's like an old friend, it's an old friend who's grown just a little slow for your fast-paced lifestyle. You're tired of waiting minutes for applications to pop open, but who among us has $3,000 lying around to purchase a brand-new Mac?

On the other hand, perhaps you just dropped a wad of cash on a new G3 Mac, and suddenly nobody at home wants to use the "dinosaur" that was once your primary system. One look at Quake running on your Power Mac 6100 and the kids are bugging you to let them at your nifty new G3 Macintosh.

In the past, upgrading an older system rarely made economic sense. But the powerful, inexpensive G3 cards avail-

Cache-Bus Speed	Cache-Bus Ratio	Comments
266MHz	1:1	Card wouldn't work in a Power Mac 7300 with interleaved RAM.
300MHz	1:1	Correct default card settings not listed in manual.
110MHz	2:1	Not the cheapest card, but a close second in bargain performance. Easy to install.
125MHz	2:1	Wouldn't work in a Power Mac 7300 until the extension loading order changed.
133MHz	2:1	Almost as fast as Newer's 275MHz model, and not as expensive. A good second choice.
183MHz	3:2	Hits the price/performance sweet spot. Easy to install.
300MHz	1:1	The fastest *and* most expensive upgrade card. Operation in 16-bit mode produces artifacts; manual offers fix.
183MHz	3:2	Card wasn't set to its default settings when received.
275MHz	1:1	Not notably faster than card with 3:2 cache ratio.
117MHz	2:1	Least-expensive card available, with great performance. Could have better documentation.
133MHz	2:1	Card wouldn't work until motherboard cache was pulled out in Power Mac 7300.
150MHz	2:1	Card wouldn't work until motherboard cache was pulled out in Power Mac 7300.
177MHz	3:2	Card wouldn't work in Power Mac 9500 with interleaved RAM.
183MHz	3:2	Card wouldn't work in Power Mac 7300 with interleaved RAM.
200MHz	3:2	In Power Mac 7300, tested with system-bus speed set to 40MHz.

able today can help transform a retired Mac from the world's most expensive doorstop into a viable system.

UNDERSTANDING THE ACME CATALOG

A computer's CPU is like a car engine. Upgrading it is like dropping a more powerful engine into your car, except with a lot less labor. There are, however, some issues you should keep in mind as you choose the right card for you.

The Cache Catch One method that upgrade-card manufacturers (and system vendors) use to increase CPU performance is to add more *cache* memory. Cache memory is special high-speed RAM that's placed physically very close to the processor. The chip stores recently used data in this cache, where the data can be accessed many times faster than if stored in the system's main RAM banks. The larger the cache you have and the faster it is, the better—up to a point.

All Macs come with a built-in CPU cache, but upgrade-card vendors can increase performance by providing larger, faster caches on their cards. Vendors often play mix-and-match games with chip speed, cache size, and cache speed, trying to squeeze out the highest performance at the lowest cost. They generally add a cache that runs either at the same speed as the new processor (a 1:1 ratio) or slower (for example, 2:1, 3:2). (See the table, "Upgrade Cards Compared," for the specs of the cards we tested.)

THE CARDS TENDED TO BE EITHER A DREAM OR A NIGHTMARE TO INSTALL, WITH VERY LITTLE MIDDLE GROUND

Generally, the larger and faster a cache you have, the better. However, once you factor in cost, there is a point of diminishing returns, as a faster cache adds to a card's expense. Our testing showed that although cards with faster caches were slightly faster overall, they were also significantly more expensive.

The Perils of Pushing the Clock Upgrade-card vendors aren't the only ones who can play games with card speeds. While upgrade cards are all advertised to run at specific clock rates, it's widely known that you can tweak your card to run faster than its rated speed. The question is, do you want to?

Chip makers, such as Motorola and IBM, provide to system and upgrade-card vendors processors that are guaranteed to run at a certain speed. That speed rating (for example, 266MHz or 300MHz) is like the line on a tachometer that tells you how fast an engine can operate safely. When an upgrade-card or system vendor installs the CPU, it adds a clock chip, which sets how fast the processor actually runs.

Speed ratings, however, aren't inviolable limits. Chip manufacturers routinely build a safety margin into ratings, meaning that a given processor can usually be made to run faster than it is rated before it will fail (and make your computer crash). Some upgrade-card manufacturers let you take advantage of this by shipping their cards with variable-speed clock chips controlled by DIP switches.

When you install one of these upgrade cards, you can slowly increase the chip speed until your system starts crashing and then bring the speed down from there just a bit. The goal is to eke out every bit of performance that your particular CPU is capable of. In theory, it's as easy as slipping on an Acme jetpack and turning up the fuel flow, but in practice, tweaking your CPU's speed is a great way to blow up all your data.

Processors are complicated, delicate components. Although a *chip designer* may decide that it's OK to bump up the clock rate on a processor, the decision is based on many years of experience and backed up by expensive test equipment that can tell if the chip is behaving correctly. When *you* push a processor too hard, you won't necessarily know when it starts producing errors. Eventually, these mistakes can add up, and your system may become unstable or simply refuse to start. Overdriven chips are also more sensitive to environmental conditions. Your hyped-up Mac may work fine in the cellar in January, but take it upstairs in August and you may be in for trouble.

If you're using your upgraded machine strictly for entertainment, you may be comfortable pushing it as hard as possible. However, you should definitely back up your data before you do, and be aware that some manufacturers—such as Mactell (www.mactell.com) and XLR8 (www.xlr8.com)—void the warranty if your settings are not those they recommend. If your computer is stuffed with essential data, though, you probably don't want a system that's running at the bleeding edge. We recommend that you stick with your card's rated speed and leave the DIP switches alone. If you do get a card that lets you alter clock rates, do it because it's the best value.

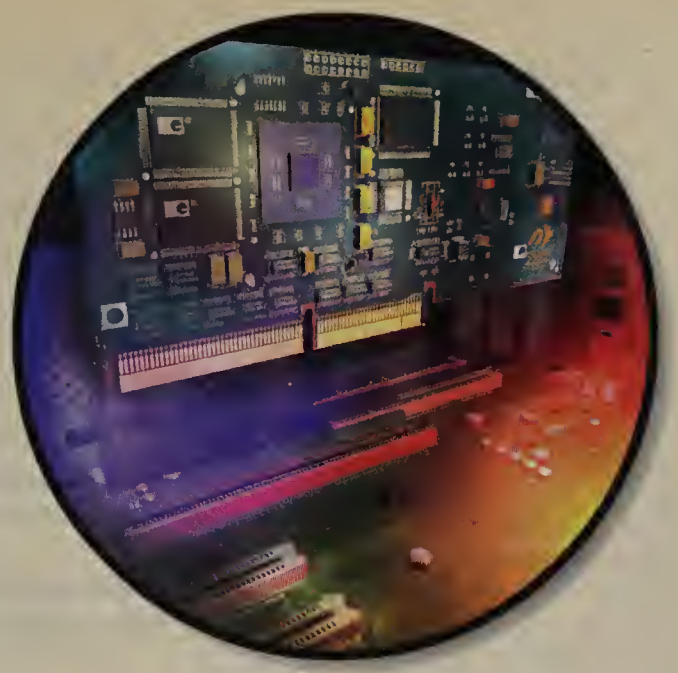
LIGHTING THE FUSE

So, what happened when the cards were put through their paces? Macworld Lab plugged, tweaked, and timed 15 upgrade cards from 5 vendors to find out how difficult the cards were to use and just how fast they could go.

Installation Investigation The cards tended to be either a dream or a nightmare to install, with very little middle ground. Newer Technology's (www.newertech.com) Maxpowr cards sport helpful installation software and generally started up and ran smoothly with no intervention required. This is a step up from vendors who simply throw the required extensions on a disk for you to drag to your System Folder.

Unfortunately, the hardware hoops we had to jump through to get some of the cards to work were not so minor.

Easy Upgrading, by the Numbers



UPGRADING YOUR OLD MAC ISN'T *QUITE* AS SIMPLE AS JUST POPPING AN UPGRADE CARD IN A SLOT, BUT THESE INSTALLATION AND TROUBLESHOOTING TIPS CAN HELP MAKE SURE YOU DON'T MISS A STEP.

1 READ THE MANUAL

Generally speaking, upgrade cards are all the same—except where they're different, of course. Manuals contain proper settings, installation tips, and troubleshooting tricks specific to your card. Be sure to read the manual—cover to cover—before trying to install a new card.

2 BE SAFE, NOT SORRY

Back up all your data, including everything on your hard drives, before you try to install the card.

3 BUY THE RIGHT CARD

Typically, a single upgrade card will work in a wide range of Macs and clones. However, some clones require modified firmware, so make sure you buy the right card for your computer.

4 GROUND YOURSELF

Every manufacturer recommends using a grounding strap—a device that keeps your body static-free—but not every manufacturer includes one in the package. Buy one. Sparking fingers fry chips fast.

5 SOFTWARE COMES FIRST

No card will run at top speed without the proper extensions installed, and some won't run at all. Load the provided software before you do a brain transplant. Make sure to call the company and check its Web site to assure you've got the latest extension.

6 HIT THE SWITCH

After you plug in the card, find the motherboard reset switch and press it. (It should be close to the processor slot. Check both your card and your Mac's hardware manuals.) You'll have to reset your date and time settings, but hitting the switch will help your system recognize the new processor.

7 CHECK YOUR SETTINGS

Double-check the card's DIP-switch settings to make sure that they match those in the manual. If they don't, fix them and call the company to confirm. In one case, we received an improperly configured card; in another case, the manual had been printed with incorrect information.

8 RENAME THE EXTENSION

Small changes in your system environment can make a big difference in compatibility. If your card's system extension loads alphabetically, try adding spaces in front of the name to force it to load first. If it's already set up this way and you're having problems, try removing the spaces so that it loads alphabetically.

9 PULL THE CACHE

We tested most of the cards with the system's own L2 cache still on the motherboard (XLR8 recommends removing the motherboard L2 cache on installation). Pulling the cache from a Power Mac 8500 is no picnic, but it may help if you're having problems.

10 ZAP THE PRAM

Several manufacturers recommend zapping your parameter RAM (⌘-option-control-P-R) while restarting. Remember that this action resets several basic system preferences (such as Date & Time, AppleTalk, and Disk Cache), so make sure that you clean up after a PRAM zap.

11 SLOW DOWN

If your system is still crashing, your final step is to lower the system-bus speed (especially if you're getting bus errors). This is one of the only times when adjusting the DIP switches can be a good idea. You'll lose some performance, but hopefully the card will work.

Macworld LAB TEST

Upgrade Cards: Older Macs Get Biggest Boost

There's no doubt about it—G3 upgrade cards can offer big performance gains. And if you have a lot invested in a Power Mac 9500 (or similarly designed 7500 or 8500), an upgrade card really offers bang for your buck. Every G3 upgrade card we tested improved the performance of our 9500 reference system by no less than 100 percent.

Best overall performance. Longer bars and higher numbers are better. **Bold** indicates best result in a subsystem test. Editors' Choice winners' names in red. SpeedMark scores are relative to that of a Power Mac 7100/80, which is assigned a score of 1.0. MacBench 4.0 scores are relative to that of a Power Mac 6100/60, which is assigned a score of 100. Percentage Improvement refers to increase over each base system's SpeedMark score, which is 2.5 for the 7300/200 and 1.8 for the 9500/132.

	SPEEDMARK		MACBENCH		
	Overall Performance	Percentage Improvement	Processor	Disk	Graphics
Mactell					
PowerJolt G3 266MHz with 1MB L2 cache at 266MHz					
Power Macintosh 7300/200 *	4.1	64	1,038	178	686
Power Macintosh 9500/132	4.3	139	1,032	**288**	602
PowerJolt G3 300MHz with 1MB L2 cache at 300MHz					
Power Macintosh 7300/200	4.3	72	**1,179**	188	778
Power Macintosh 9500/132	4.6	156	1,161	281	631
Newer Technology					
Maxpowr G3 220MHz with 512K L2 cache at 110MHz					
Power Macintosh 7300/200	3.4	36	703	187	480
Power Macintosh 9500/132	3.6	100	722	283	523
Maxpowr G3 250MHz with 512K L2 cache at 125MHz					
Power Macintosh 7300/200	3.6	44	771	189	501
Power Macintosh 9500/132	3.8	111	800	282	548
Maxpowr G3 266MHz with 1MB L2 cache at 133MHz					
Power Macintosh 7300/200	4.0	60	931	187	637
Power Macintosh 9500/132	4.2	133	938	286	596
Maxpowr G3 275MHz with 1MB L2 cache at 183MHz					
Power Macintosh 7300/200	4.1	64	984	190	552
Power Macintosh 9500/132	4.5	150	994	284	589
Maxpowr G3 300MHz with 1MB L2 cache at 300MHz					
Power Macintosh 7300/200	**4.5**	**80**	1,175	186	**816**
Power Macintosh 9500/132	**5.0**	**178**	1,171	**288**	661
PowerLogix					
PowerForce G3 275MHz with 1MB L2 cache at 183MHz					
Power Macintosh 7300/200	4.0	60	1,002	186	675
Power Macintosh 9500/132	4.4	144	996	284	569
PowerForce G3 275MHz with 1MB L2 cache at 275MHz					
Power Macintosh 7300/200	4.1	64	1,074	180	549
Power Macintosh 9500/132	4.5	150	1,064	286	596
Sonnet Technologies					
Crescendo G3 233MHz with 512K L2 cache at 117MHz					
Power Macintosh 7300/200	3.4	36	736	181	543
Power Macintosh 9500/132	3.6	100	748	275	483
Crescendo G3 266MHz with 1MB L2 cache at 133MHz					
Power Macintosh 7300/200	3.8	52	927	181	617
Power Macintosh 9500/132	4.1	128	921	286	551
Crescendo G3 300MHz with 1MB L2 cache at 150MHz					
Power Macintosh 7300/200	4.0	60	1,051	185	639
Power Macintosh 9500/132	4.4	144	1,040	286	579
XLR8					
Mach Speed G3 266MHz with 1MB L2 cache at 177MHz					
Power Macintosh 7300/200	4.2	68	972	178	741
Power Macintosh 9500/132 *	4.1	128	961	284	578
Mach Speed G3 275MHz with 1MB L2 cache at 183MHz					
Power Macintosh 7300/200 *	3.9	56	1,000	185	724
Power Macintosh 9500/132	4.2	133	995	286	594
Mach Speed G3 300MHz with 1MB L2 cache at 200MHz					
Power Macintosh 7300/200 **	4.0	60	1,091	181	788
Power Macintosh 9500/132	4.5	150	1,084	287	617

** Card tested with noninterleaved RAM. ** Tested with system-bus speed set to 40MHz.*

Behind Our Tests

Macworld's SpeedMark test suite runs 54 real-world tasks in 15 programs and the Finder to determine a Mac's overall performance. MacBench 4.0 uses special test programs tuned to measure and isolate the performance of the processor, disk, and graphics subsystems. (Download your own free copy of MacBench 4.0 from www.macbench.com.) Test platforms had 32MB of RAM, a 512K disk cache, and Mac OS 8.0. All displays were set to 16-bit color in 832-by-624-pixel resolution. Due to stability problems, some cards were tested either with noninterleaved RAM or with adjusted system-bus speeds.—**Macworld Lab testing supervised by Gil Loyola**

Pulling the L2 cache off the motherboard was one of our (more extreme) troubleshooting steps. But XLR8's Mach Speed cards *require* that you pull the L2 cache memory off your system's motherboard—no casual task for anyone, and a major pain if you own an 8500. One vendor's card came with the speed switches misconfigured, and another batch of cards (one from Mactell and two of the XLR8 cards) wouldn't work in some systems until we de-interleaved the RAM modules (in the end, costing some system performance).

All of the cards we tested came with some sort of manual, but we couldn't always count on the documentation to solve our problems. See the sidebar "Easy Upgrading, by the Numbers" for our hands-on tips.

Speed Trials When we put the cards through their paces on our test bench (a Power Mac 7300/200 and a 9500/132), we found that a faster chip, a faster cache, and a larger cache typically added up to higher performance.

Newer's Maxpowr G3 cards were generally faster than similarly configured cards from other manufacturers, but only by a hair, and prices varied dramatically across the field. If you own a Power Mac 9500/132, for instance, most cards of roughly similar speed (275MHz to 300MHz) provide a roughly 150 percent performance increase. It's your wallet that will be able to tell the difference—those similarly performing cards' prices range from $1,099 to $2,199.

FROM SNAIL TO ROAD RUNNER

After considering the pain and gain inherent to all these upgrade cards, we chose two cards that pulled off the best balance: a low-cost option for limited budgets, and a price/performance champ that gives the most powerful punch at a reasonable cost.

Best Bargain Upgrade Newer Technology's 220MHz Maxpowr G3 and Sonnet Technologies' (www.sonnettech.com) 233MHz Crescendo G3 fought ferociously for the bargain-card title. The two competitors ran neck and neck in our real-world SpeedMark tests, with the Crescendo posting a slight advantage in low-level MacBench testing. The Maxpowr evened up the gap during installation, thanks to Newer's outstanding manual and software, but the Crescendo pulled ahead at the finish line with a list price $200 less than the Maxpowr's—this represents a significant amount at that price level.

WE CHOSE TWO CARDS THAT OFFERED THE BEST BALANCE: A LOW-COST OPTION AND A PRICE/PERFORMANCE CHAMP

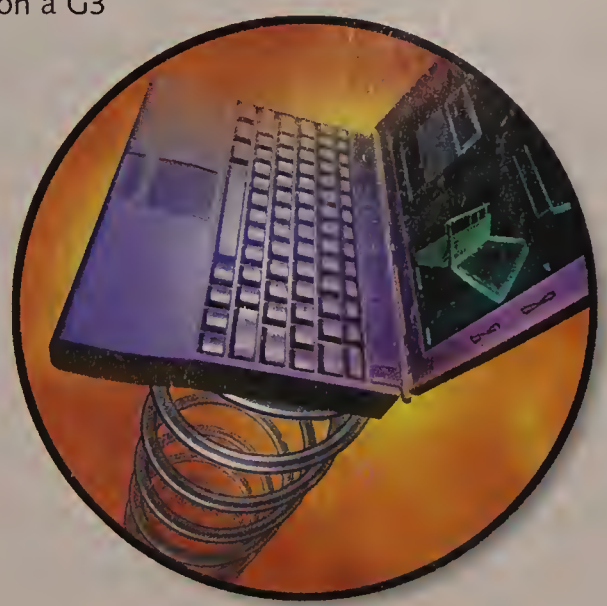
Note, though, that small differences in list price often disappear at the retail level. Both of these cards are solid purchases and worth snapping up.

High-Speed Value The race for all-around champion was no less hotly contested. XLR8 and Sonnet both have cards that are in the right price and speed ranges

Power for the Road

WHAT BETTER USE COULD THERE BE FOR A BLAZING UPGRADE CARD THAN TO PERK UP an anemic PowerBook? If you've got a PowerBook 1400 and you're looking for a little more speed, you're in luck: Newer Technology is working on a G3 upgrade for your road machine.

So far, Newer has two models planned: a 216MHz processor with a 512K cache running at 108MHz, and a 250MHz chip with a 1MB cache running at 125MHz. Neither card was shipping as we went to press, but we got our hands on a beta version of the 250MHz model and ran it through its paces. The preliminary card nearly tripled the speed of the 1400c/166, which ordinarily runs just a little faster than a Power Mac 7100/80. Watch *Macworld* for a full review when the cards ship.



Newer is also planning an upgrade for the PowerBook 2400, which is not expected to be available by the time you read this. No other vendor has announced plans to build PowerBook upgrade cards.

but that suffer from technical difficulties.

We had to pull the motherboard cache to make Sonnet's surprisingly inexpensive 300MHz Crescendo work, and to juggle our test system's RAM to get XLR8's 275MHz Mach Speed G3 up and running. These installation difficulties knocked both companies' cards out of the running. Mactell's cards suffered from similar problems and were way too expensive.

When the dust cleared, Newer Technology's 275MHz Maxpowr G3 stood out as the best compromise between speed and cost, with the Maxpowr 266MHz version running a close second. Trouble-free installation, price, and performance made this card the clear winner.

MACWORLD'S BUYING ADVICE

So which upgrade card should you buy? First of all, pick a card that's right for your Macintosh. All the cards we looked at will work in the following computers: Apple Power Macintosh 7300, 7500, 7600, 8500, 9500, and 9600; Umax J700 and S900 series; and Power Computing PowerTower Pro, PowerWave, PowerCurve, and PowerCenter Pro. As we went to press, cards for older Power Macs weren't yet available.

REMEMBER THAT A CPU IS JUST ONE OF THE COMPONENTS THAT CONTRIBUTE TO YOUR COMPUTER'S OVERALL PERFORMANCE

Next, think long and hard about whether upgrading is really the right choice for you:

If You've Got an Older Power Mac An upgrade card is a pretty good deal if you own a 7500, 8500, or 9500 or an early clone from Power Computing or Umax. This is especially true if you've invested a lot in add-ons, such as RAM and hard drives. Owners of first-generation Power Macs (the 6100, 7100, or 8100) can probably look forward to 200 percent speed boosts for well under $1,000, when those cards become available. That's a deal that's hard to beat.

If You Own a 7300 or Newer Machine It just doesn't make much sense—except in special cases—to shell out more than $1,000 for a 60 percent performance gain when you can get that same speed gain (or more) by buying a brand-new G3 Macintosh for $2,000.

Before You Buy Anything Remember that a CPU is just one of the components that contribute to your computer's overall performance. Buying a faster processor almost always gives you a pleasant speed increase, but there are other essentials that can make a big difference too. If your Mac constantly reminds you to close windows and quit applications, you probably need more RAM. If you use certain types of software, such as databases, more storage might be what you lack. However, if you work with graphics or play lots of games, a graphics accelerator card may do the trick.

PowerPC G3–based upgrade cards are still new and exciting, so you should expect prices to fall as the market stabilizes. Even so, if you own an older Macintosh or clone, our two Editors' Choice cards—Newer Technology's Maxpowr G3 275/183 and Sonnet Technologies' Crescendo G3 233MHz—have prices that are low enough and performance numbers that are high enough to warrant serious consideration. After all, Wile E. Coyote was never able to catch Road Runner. When you pop in one of these upgrade cards, he won't be able to catch your old Mac, either. m

Systems expert CAMERON CROTTY (everyman@wenet.net) wrote this article on a Power Mac 7100/80, and he's convinced it's getting . . . slower . . . by . . . the . . . minute.

EDITORS' CHOICE

Bargain Upgrade

♦♦♦½ **Sonnet Technologies Crescendo G3 233MHz** This slick little card doubled the speed of our Power Mac 9500 test system, and while we'd like to see beefier documentation, you can't beat the price. **Company:** Sonnet Technologies (714/261-2800, www.sonnettech.com). **List price:** $499.

High-Speed Value

♦♦♦♦ **Newer Technology Maxpowr G3 275/183** There are faster cards, and there are less expensive cards, but none pack the punch of the 275MHz Maxpowr while treading as lightly on your wallet. **Company:** Newer Technology (316/943-0222, www.newertech.com). **List price:** $1,299.

REAL PRODUCTS REAL RATINGS

Reviews you can trust *Macworld* rates only final shipping products, not prototypes. What we review is what you can actually buy.

Microtek Makes Film Scanning "Pane-less."

STEP UP TO MICROTEK

Every once in a few years an innovation comes along that rocks the scanning industry. Microtek's engineers and color scientists have been responsible for so many of them. And now, they've done it again.

We call it **E.D.I.T.™** or *Emulsion Direct Imaging Technology*.™ With E.D.I.T. you can actually capture a scanned image from a transparent original without an interfering pane of glass.

Instead of a conventional transparent media adapter, your film is placed into one of five holders (*SnapTrans™ Templates*). A template snaps into a tray and which is then inserted into the scanner (like the new high-resolution *ScanMaker® 5* color flatbed scanner shown above).

The benefit to you? No refracted light diminishing the values of your original. No "Newton-rings" either – those annoying concentric circles that appear in scanned images when film is sandwiched between two panes of glass.

Of course, these are just two of the benefits you'll experience with the new ScanMaker 5. We haven't even talked about the superb reflective scans you get, or the single-pass speed, or the great bundled software, or Microtek's award-winning ScanWizard software...

FEATURES

- Microtek's patented E.D.I.T.™ (Emulsion Direct Imaging Technology™ – U.S. Patent No. 5,574,274)
- Full 36-bit input/output (in "Billions of Colors" mode)
- 1,000 x 2,000 dpi optical resolution / 8,000 x 8,000 dpi enhanced
- 5 SnapTrans™ templates for film stocks from 35mm to 8" x 10"
- Solid stainless steel chassis
- 3 long-life cold cathode lamps
- Precision-machined aluminum optical carriage
- High grade optically flat first surface mirrors yielding 95% reflective light for lower image noise
- Intel® 80186 processor on-board
- Microtek's award-winning ScanWizard scanner controller (featuring batch scanning, descreening, downloadable gamma curves, unsharp masking, exposure control per RGB and more)
- MetaCreations™ Painter™ 5 (Windows or Macintosh models)
- Image-editing and color calibration software with targets

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Bundled software and manuals on CD-ROM. All products mentioned are trademarks or registered trademarks of their respective holders. Specifications and software bundles are subject to change without notice. SM5PCW98

Photoshop PUMPS UP

by Deke McClelland

Wait no more—this powerhouse upgrade has what you've been looking for

EDITABLE TYPE. MULTIPLE UNDOS. SUPPORT FOR SPOT-COLOR SEPARATIONS.

If you're one of the thousands of designers who regularly depend on Adobe Photoshop, you've probably hoped for these features for years, and were likely disappointed that none of them arrived with the release of Photoshop 4.0 last year. To be fair, Photoshop 4.0 did make one big item on my wish list come true: it introduced a caching scheme that accelerated certain kinds of layer operations. But its most significant achievement had almost nothing to do with fulfilling user demands. It was a redesigned interface that brought Photoshop more in line with Illustrator and PageMaker (see "Photoshop's New Look," February 1997). Thankfully, things are about to change. Photoshop 5.0 ($995, $249 upgrade; 408/536-6000, www.adobe.com) offers all the big features that have been conspicuously absent in the past: the type is editable, the undos are multiple, and the colors go beyond CMYK. Compared with previous versions, Photoshop 5.0 is bursting with enhancements that are lavish in their execution. Boasting more new features than any previous upgrade (including the best implementation of multiple undos I've ever seen), Photoshop 5.0 is the model by which future upgrades will be judged. Few artists—even those who are stuck with version 3.0—can afford to ignore it.

But while Photoshop 5.0 is powerful, it's by no means easy to use. In fact, on first blush a few elements may seem downright hostile. One feature in particular, which seeks to achieve consistent color between monitors, ranks among Photoshop's most complex and intrusive capabilities. By default, Photoshop will change the colors in your images—frequently for the *worse*—without so much as consulting you.

To avoid potential pitfalls like these, you need to plan ahead, and that's just what this Expert Guide is all about. I've spent several months examining beta versions of the new Photoshop to uncover its most critical features and unravel its most demanding operations. I've also put together an extensive list of new keyboard shortcuts to help you hit the ground running (see the table, "Navigating the New Keyboard Shortcuts"). Photoshop 5.0 is sufficiently tricky that some artists will be tempted to write it off as a cruel

JENNIFER JESSEE

joke. But I hope that with the proper introduction, you'll come to appreciate it as the splendid upgrade it is.

WORRY-FREE EDITING

If one single feature defines Photoshop 5.0, it has to be the History palette. Used at its most basic level, the History palette satisfies an often-voiced demand for multiple undos inside Photoshop. You can back-step and forward-step as many as 99 operations (20 by default), even after saving or printing the file.

For years, Adobe has warned that adding multiple undos to an image editor would greatly increase its RAM requirements. They weren't kidding. Photoshop 5.0 only runs on PowerPC-based Macs and guzzles RAM with a renewed appetite. (Although Adobe recommends at a minimum 32MB of system memory, you'll probably need 64MB to get the most out of multiple undos.)

Despite its RAM gluttony, I'm satisfied that the undos are handled as efficiently as possible. Like MetaCreations' Painter 3.1—which introduced multiple undos in image editors three years ago—Photoshop buffers just those portions of the image that are affected by an operation. A small brushstroke takes less of a hit than a filter applied to the entire image. And, of course, you can always turn multiple undos off.

Full-Tilt Time Traveling

The History palette goes well beyond simple back-stepping—its versatility ultimately distinguishes Photoshop 5.0 as the best digital undoer. Every buffered operation is itemized as an independent state, so reverting to a previous state is simple: just click on it, and bang, you're there.

Photoshop manages a separate set of states for each open image. By default, you can perform 20 operations in Image A, switch to Image B for a few hours, then return to Image A, and still have access to all of that image's undos. Even better, you can specify *which* states you want Photoshop to remember—just because you've set 20 as the number of states to be monitored doesn't mean they have to be the 20 most recent states.

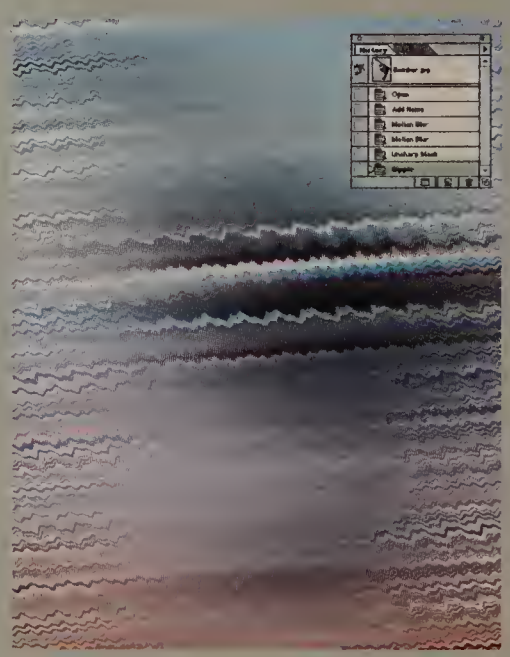
Suppose you paint a series of brushstrokes. When you finish, the History palette lists six Paintbrush states. To you, it felt like one set of brushstrokes—you plan to either keep them all or undo them all in one fell swoop. By deleting all but the final Paintbrush state, you ensure that other, more important operations don't get squeezed out of the history buffer as you continue to edit.

You can also save key states as snapshots, which remain buffered as long as the image is open, regardless of how many states Photoshop is set to remember. If

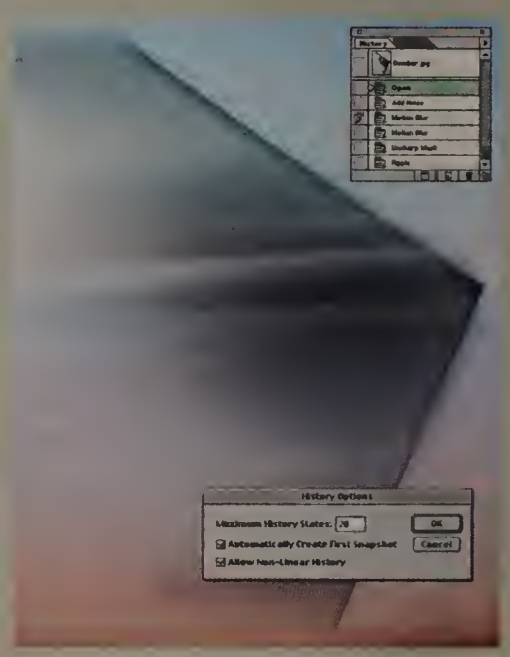
Painting with Time

If the advent of independent layers opened up the third dimension in Photoshop, then the History palette lets you enter the fourth—by literally traveling backward and forward in time. As with any program that offers multiple undos, you can edit an image without worrying about making an irreversible mistake. But even more important, you can experiment with alternative futures and blend these futures with the present. The History palette temporarily records your operations as independent states that you can retrieve at will during your work session. You can even merge one state with another either by option-dragging with the eraser or by painting with the new history brush.

A I started with a photograph of the B-2 bomber from the Digital Stock image library. The bomber looked pretty nifty hovering in the air like that, but it was a little static for my taste. I reckoned it'd look better buzzing by at a million miles an hour in a gush of flames, like a prop from *Independence Day*.



B To create the raw materials for my motion trails, I applied a series of filters. First I added some noise to give the image grit. Then I applied two passes of the Motion Blur filter. Finally, I sharpened the blur to accentuate the stripes of color and used the Ripple filter to give the stripes a bit of wave. The effects were interesting, but they obliterated the bomber.



C After selecting the Allow Non-Linear History option (to save the filtered states even if I decided to undo them), I reverted the image to its original state by clicking on the Open item in the History palette. After selecting the second Motion Blur state as the source, I used the history brush to paint in the filtered effects to create a unidirectional motion trail.

the state seems crucial, you can save it to disk for long-term retrieval.

The single-step Undo/Redo command functions independently of the History palette. This means you can undo changes made *inside* the History palette. Delete a state that you shouldn't have? Just press ⌘-Z. Want to flash forward and backward between states? Press ⌘-Z. You always have a safety net.

Combining Past and Future

If this were all there was, Photoshop 5.0's undo model would be a generation ahead of any other previously available. But the program offers two additional features that transform the History palette from a top-notch convenience feature into a solid production tool:

• **History brush** This new tool permits you to paint from any state listed in the History palette (provided the state contains the same number of pixels). So even if you rack up a series of mistakes, you can easily erase them away in one operation—without saving the image or taking snapshots, as you had to in the past.

• **Allow Non-Linear History option** This is the History palette's crowning touch. Just because you undo a state and go off in a different direction doesn't mean the undone state must drop out of the buffer. By merely checking a box, you can preserve it for later retrieval—which gives you the freedom to experiment with multiple future scenarios and then paint them back in with the history brush (see the sidebar "Painting with Time").

The History palette has just one limitation. It buffers operations throughout a single session only. If you quit or crash, all states but the saved one are lost. While this is true for the undo command in any application, the general excellence of the History palette encourages you to expect more. I can't tell you how many times I've wished I could save the contents of the undo buffer to disk, just in case.

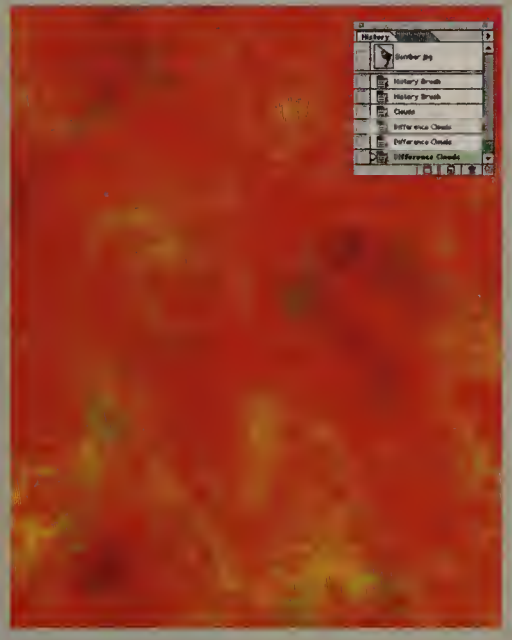
TEXT AND EFFECTS LAYERS

While the History palette is a hard act to follow, Photoshop 5.0 manages to round out its considerable supply of elastic editing capabilities with a revamped type tool and a collection of numeric layer effects—features that were previously available only through Extensis's PhotoTools plug-ins. Although neither of these functions is as flat-out exemplary as the History palette, they're welcome additions and are better implementations than those of their plug-in predecessors.

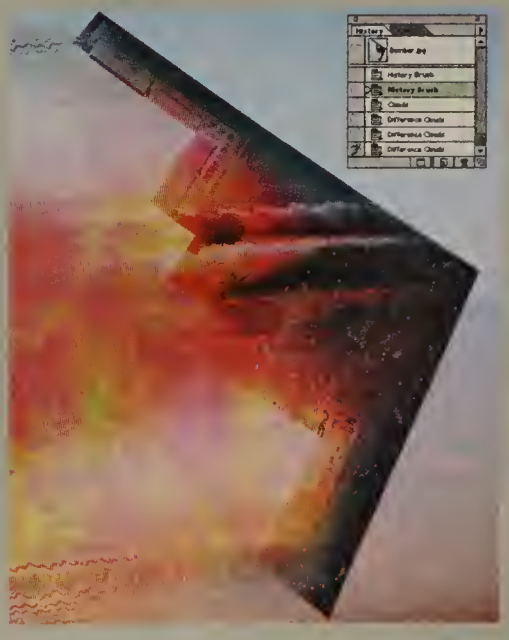
A New Type of Layer

Photoshop saves editable type as a special kind of layer. You can change the layer's opacity or blend mode, add it to a clipping group, rotate or scale the text, and apply

D The history brush also permits you to apply one state to another using blend modes. I selected the Ripple state as the source for the history brush and painted it into the current state using the Overlay mode. Then I set the source state to the original Open state and brushed that into the current state containing the previous brushed-in effects using Multiply. The result is a rushing effect that enhances the bomber without annihilating it.



E But a fast bomber wasn't enough; it needed to be fiery as well. To make the fire, I set the foreground and background colors to red and yellow, respectively, and applied the Clouds filter. Then I chose Difference Clouds three times to round out the billowy flames.



F Even more than the previous filters, Clouds and Difference Clouds drowned out the bomber. So I used ⌘-option-Z to backstep to the state just before Clouds. Then I selected the final Difference Clouds state as the source for the history brush and painted in the fire.

The timeline of the History palette lets you plan a network of possible futures. It's like standing at a fork in the road with the option of going in all directions at once. In my case, the road forked in two directions, the Motion Blur experiment in one and the Clouds effects in the other. No other program lets you paint with time in such a dynamic and satisfying manner.

layer effects without losing the text's editability. But if you want to apply a filter, paint inside the text, or make some other pixel-level edit, you must first render the type, making it uneditable (see the screen shot "Limits of Editable Type").

You can also mix and match formatting attributes within a single text layer. The one exception is color; Photoshop permits just one color per text layer. You can edit text as easily as clicking on a letter with the type tool. Photoshop 5.0 supports manual pair kerning, and it subscribes to the standard formatting shortcuts made familiar by Adobe's object-oriented products, Illustrator and PageMaker (see the table).

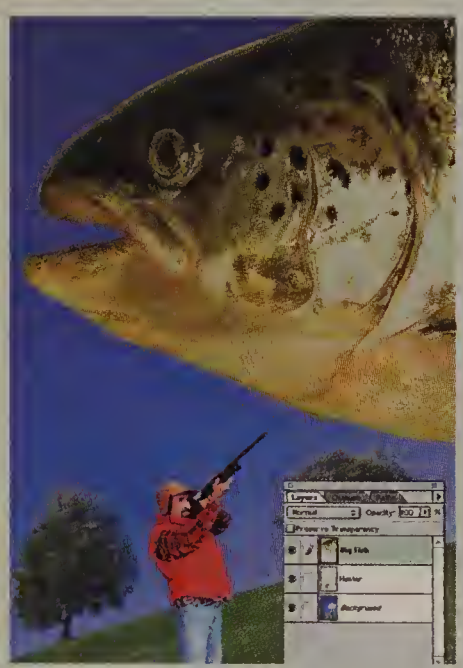
Many users had hoped Photoshop would implement an object-oriented text layer with type on a path and other Illustrator-like functions. But type in 5.0 remains forever bitmapped, and you still have to edit it inside a dialog box. Also, Photoshop still has no understanding of column width, so—just as in previous versions—you must press the return key to wrap a word down to the next line.

Calculating Effects

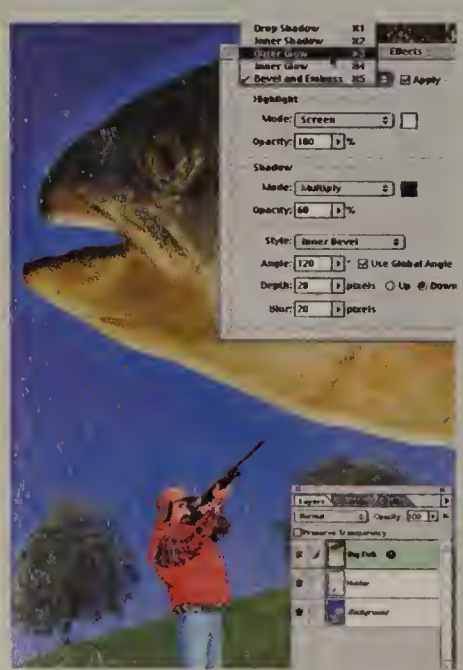
You can apply effects such as drop shadows, glows, and beveled edges to layers by entering values into dialog boxes. While layer effects don't entirely eliminate the need to create manual drop shadows and the like, they offer plenty of advantages. The effect automatically conforms to the shape of the image on the layer, so if you

Intelligently Defined Layer Effects

Normally, I'm not one to get worked up over drop shadows, glows, and beveled edges, particularly when they're the subject of automated effects. Virtually every two-bit image editor on the planet offers a drop-shadow command—and they're typically bare-bones implementations with few fine-tuning controls and little attention to detail or usability. In fact, Photoshop 5.0's layer effects are the first such tools I've ever had any inclination to use. And they're every bit as practical as they are fun to play with.

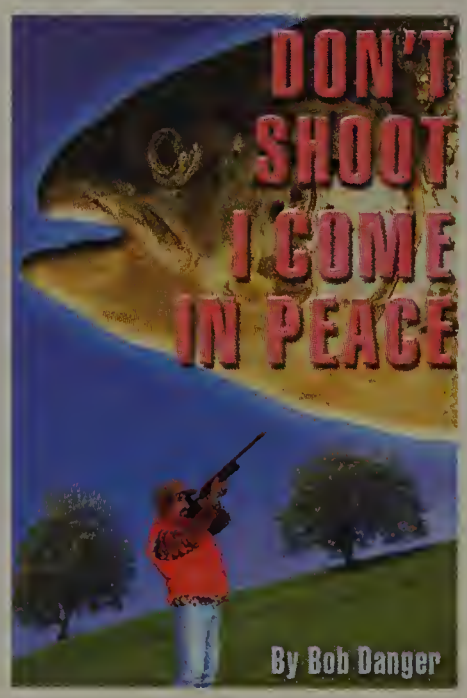


A Photoshop's layer effects are layer-dependent, so naturally you have to start off by assembling a layered composition. In creating a book jacket for a story about a dread monster from outer space, I kept my composition simple: a sparse background, an intrepid hunter on one layer, and the invading monster (one colossal yellow fish) on another. But while the monster was clearly dramatic, he didn't quite project the luminous, haunting visage I was looking for. It was an obvious job for layer effects.



B I control-clicked on the Big Fish layer to bring up a pop-up menu of layer-specific operations. From these, I chose the Effects command. Photoshop displayed a huge dialog box with five categories of effects that provided me with access to a variety of shadows, glows, and beveled edges. I applied a blue glow around the outside of the fish along with a thick, beveled perimeter. The result was a monster with more presence, a fish that looked as if it might actually be larger than life.

After you apply a layer effect, Photoshop brands the layer in the Layers palette with a cursive *f*. You can revisit and edit the effect simply by double-clicking on the *f*. If you transform, erase, or paint inside the layer, Photoshop automatically updates the effect accordingly. And if you want to disable the effect, just option–double-click on the *f*. (Option–double-click disables effects in the order applied, while pressing option when choosing a command undoes that specific effect.) Finally, if you need more control, you can render the effect out to independent layers and edit each shadow and highlight manually.



C My favorite feature of layer effects is that you can transfer them between layers. After creating the title text for my book, I copied the glow and bevel effects from the Big Fish layer and pasted them onto the text layer. The glow didn't really make sense for the title, so I pressed option and chose the Outer Glow command to disable that effect. Then I edited the bevel to better fit the letters.

Another great feature of layer effects is that they can all subscribe to a global light source. So long as the Use Global Angle check box is active for each effect, modifying the angle of one effect will do the same for all the others. We're not talking photo-realistic lighting here, but the global light source makes it easy to change your mind without sacrificing consistency.

edit or transform the image, Photoshop modifies the effect to match. It also calculates the effect on the fly, so you can edit it indefinitely, plus it consumes very little memory. And you can copy an effect from one layer and paste it onto several other layers simultaneously (see the sidebar "Intelligently Defined Layer Effects").

Experts will surely pooh-pooh this feature as one geared toward beginners, but I have no doubt that, over time, layer effects will catch on with a vengeance.

COLOR MANAGEMENT

The new feature that's liable to give experienced Photoshop artists the most trouble is color management. I had been using a beta version of Photoshop 5.0 for a week before I grasped the meaning of the simple message "Converting colors" that appeared every time I opened an image: the program was rewriting the colors of my pixels and had been doing so for several days. As a result, I enjoyed the dubious pleasure of having to revisit several of my images and fix them.

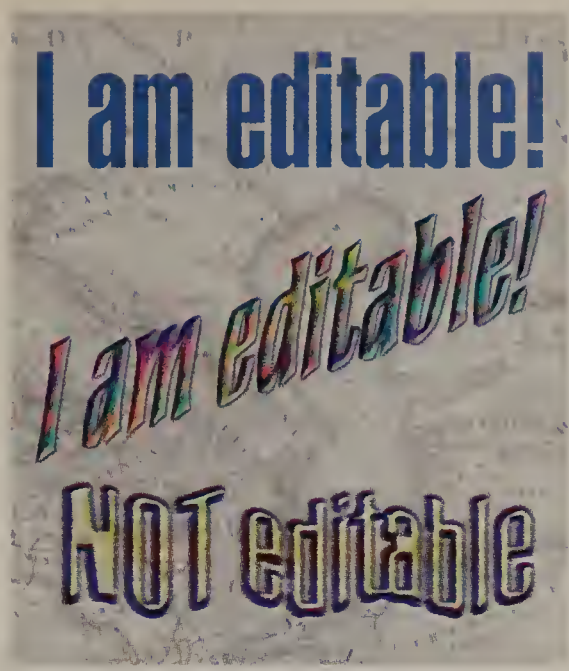
Adobe's intentions are commendable. The program is trying to convert RGB and gray-scale images created on a foreign system so that they display accurately on yours. But the conversion works only if your monitor is properly calibrated, the image contains a profile for the source monitor, and the source monitor itself was properly calibrated. That's a lot of improbable conditions for a feature that works without securing your consent.

While the default settings are highly suspect, the concept and general implementation are excellent. When used properly, Photoshop 5.0 does a far better job than its predecessor of maintaining consistent colors from one screen to the next and even across platforms. But you have to know what you're doing, and that takes some extra effort.

Three Steps to Better Color

Photoshop 5.0 will likely ship with PDF instructions for getting up and running with its new Color Settings commands. But my guess is that most new users won't read them, and those who do may not fully understand their importance or comprehend their meaning. Fortunately, you should be fine if you perform the following three steps in order:

• Calibrate your screen Before running Photoshop 5.0, be sure to calibrate,



Limits of Editable Type Editable text is surprisingly versatile in Photoshop 5.0. Here, I changed the blend mode to Multiply (top) and applied a clipping group and bevel effect (middle) without affecting editability. But before I could paint and apply various filters (bottom), including Median, Wave, and Gaussian Blur, I had to render the text to a standard layer.

or at the very least "characterize," your screen. If you own a monitor such as the Radius PressView 21SR or the Mitsubishi SpectraVision 1000, then you can calibrate it using the hardware and software included with the device. Otherwise, you may have to settle for characterizing your screen—that is, merely describing its capabilities and limitations without compensating for them—using the redesigned and straightforward Gamma wizard included with Photoshop (see the screen shot "Three Steps to Consistent Color"). Either way, you get a ColorSync-compatible ICC profile of your monitor that Photoshop 5.0 loads during start-up.

• Select an ideal RGB environment Because Photoshop 5.0 lets you define a monitor-independent RGB workspace, you can preview how an image will look on a different screen. But the real purpose for selecting an RGB environment is to permit Photoshop to perform its color calculations unconstrained by the limitations of your particular monitor. That's why experts have given a thumbs-down to Adobe's choice of the Microsoft-blessed sRGB as the program's default setting. Although great for previewing a Web image on a typical PC screen, sRGB is terrible for prepress professionals, since it restricts Photoshop's color-calculating capabilities. While the jury is out on precisely which setting you should use, ColorMatch RGB (based on a typical PressView) or SMPTE-240M (the HDTV standard) look like your best bets.

• Tell Photoshop to ask you before making any conversion This is the most imperative step. Choose the Profile Setup command and set the three Profile Mismatch Handling options to Ask When Opening. Now, when Photoshop detects a file that it believes was created on a different system (or in a different RGB workspace), an alert message will appear asking whether or not you want to convert the image. This puts the control back in your hands—right where it should be.

The wonderful thing about using a screen-independent RGB space like SMPTE-240M is that it means you can share an RGB image with another Photoshop 5.0 user and be confident that your image will look roughly the same on the foreign monitor as it does on yours. (In the past, only the Lab and CMYK Color models have offered such assurance.)

In a perfect world—where everyone used Photoshop 5.0 correctly—you'd be able to send an RGB image to your commercial print house and let the technician decide which CMYK settings will produce the best separations. On the other hand, if you're concerned that your printer doesn't properly understand Photoshop 5.0, then you can submit CMYK or Lab images, just as in the old days.

Spot Colors and Indexing

Photoshop 5.0's new spot-color capabilities are likely to generate a lot of interest, even though they're addressed in the most elementary fashion possible. You add an alpha channel, assign a Pantone color or the like, and modify the ink's solidity to produce a reasonable facsimile of the printed image on screen. Then you export the image as a DCS 2.0 file and import it into your publishing program. But while the implementation is hardly what I'd call robust—Photoshop 5.0 doesn't do knockouts, nor does it support metallic or Day-Glo inks—it gets the job done.

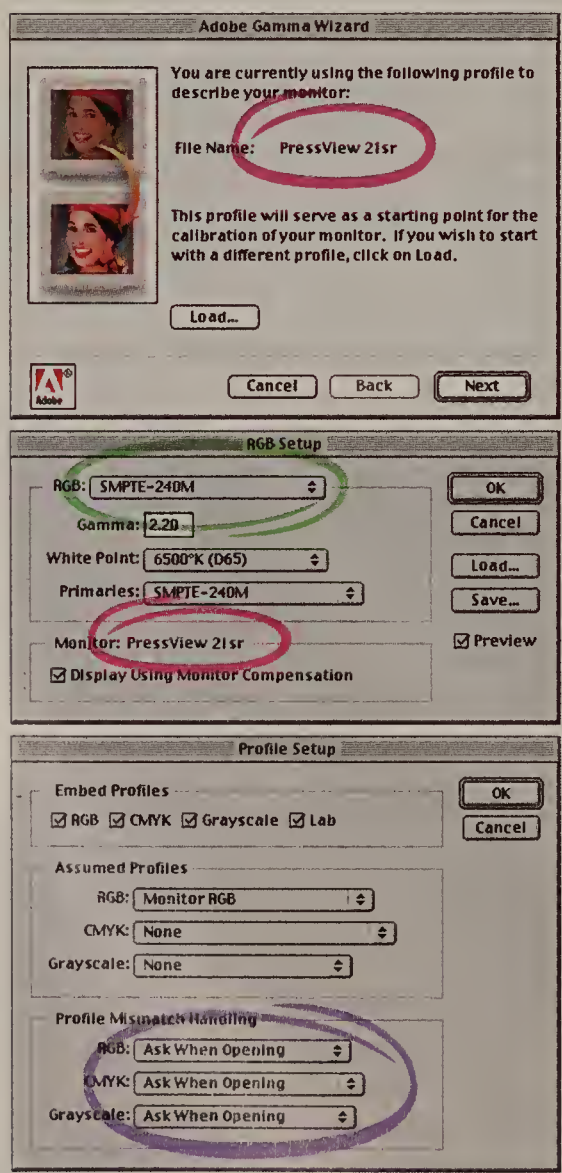
Photoshop 5.0's best color refinements are its most subtle. You can now target ranges of color with more precision inside the Hue/Saturation and Curves dialog boxes. And Curves lets you make numerical changes. All that's needed now is a dynamic histogram inside the Curves dialog box, and you never need visit Levels again. The new color-sample tool lets prepress technicians set as many as four fixed color targets inside an image and

monitor these points from the Info palette. You can even set and move targets when a dialog box is open.

Best of all, the Indexed Color dialog box previews its settings in the image window, so you can see what your GIF image will look like before you apply a bit depth. It won't make professional Web designers banish their libraries of plug-ins—although new applications like Adobe's ImageReady and Macromedia's Fireworks might (see the feature "Web Design's New Dynamic Duo," elsewhere in this issue)—but it's enough to satisfy weekend Web artists like me.

SELECT, LAYER, TRANSFORM

Adobe has made literally hundreds of little changes to Photoshop's selection, layering, and transformation capabilities. The most prominent among these are the new magnetic lasso and magnetic pen tools, which automatically trace the edges of a clearly defined foreground image (see the screen shot "Magnetic Selections"). After clicking with one of these tools, you have only to move the cursor (with the mouse button up) around the image you want to select. You can adjust the range of the tool on the fly by pressing the bracket keys ([and]), which comes in handy when selecting inside crevices and around sharp corners. The magnetic tools aren't miracle workers, but for those more concerned with speedy results, they do an adequate job.



Three Steps to Consistent Color Photoshop 5.0's revamped Gamma wizard (top) generates a ColorSync profile that automatically loads when you launch Photoshop (middle). Set the RGB option to SMPTE-240M and the Profile Setup options to Ask When Opening (bottom), and you're ready to trade RGB images with other prepress professionals.

The other new additions might not qualify as earth-shattering, but often it's the small improvements that make the biggest difference in how well an application suits your needs. In fact, I'm willing to bet that as you read through the following list, you'll discover at least three features that have been on your top-ten wish list for the last few years:

• **Reselect** You can restore the most recent selection outline by pressing ⌘-shift-D. Personally, I've been surprised at how often this comes in handy. I tend to select the same area over and over, and I'll bet you do, too.

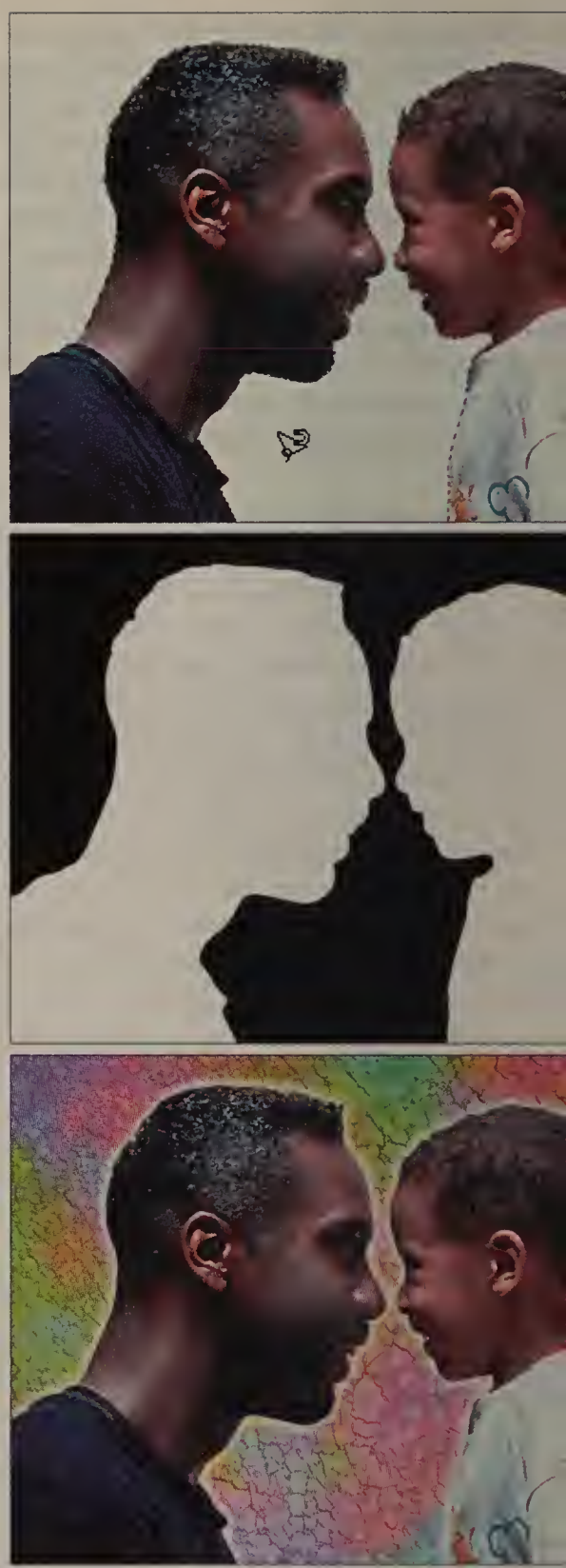
• **Transform** For selections and paths, this command lets you rotate, scale, or skew a selection outline independently of an image. You can likewise transform whole paths, multiple paths, or a handful of selected points, just as in Illustrator.

• **Transformation origin** You can move the center of a transformation simply by dragging it. This is essential when performing precise rotations.

• **Transform again** After rotating or scaling a layer, just press ⌘-shift-T to repeat that same transformation on another layer. You can also repeat a transformation that was last applied to a path or selection outline.

• **Align and distribute layers** That's right, Photoshop 5.0 automatically aligns and distributes (evenly spaces) layers, whether the layers contain text or image elements. Just link the layers you want to modify and choose the desired command. When you're aligning, the active layer anchors the alignment.

• **Measure tool** Ever since the Info palette was first introduced, folks have been measuring distances and angles by drawing invisible lines with the line tool. Now Photoshop gives you a dedicated tool designed for this purpose. Measurement lines remain intact throughout a session in case you want to revisit them. Option-drag the end of a line to extract a second "protractor" segment, which is useful for gauging the angle of crooked scans and for slanting image elements.



Magnetic Selections If an image stands out clearly from its background, then it's easier to select it with the magnetic lasso than with any other tool (top). As you can see by the mask version of the selection (middle) and the final composite (bottom), the selection isn't perfect. But considering that it took me about 30 seconds to draw, it's not bad.

• **3-D distortions** As anyone familiar with Live Picture knows, Photoshop could use better warping functions. A new filter called 3D Transform wraps images

around three-dimensional primitives such as spheres, cones, and cubes. While the filter lacks lighting capabilities—which diminishes its value as a 3-D imaging tool—it serves quite nicely for creating bumps, twists, and other warping effects.

THE LAST WORD

Frankly, I hold Photoshop to a tougher standard than other software. Certainly, Macromedia FreeHand, Painter, and a half dozen other topflight applications provide essential functions to the graphic arts community. But I know of no other application that would leave such a gaping hole if it were to disappear. Entire industries have become dependent on Photoshop, and thousands of artists use the program every working day of their lives.

So it's not enough for Photoshop to be a good program. It has to be outstanding merely to satisfy the daily needs of its demanding audience.

But even when measured by a different yardstick than the rest of the pack, Photoshop 5.0 is something special. Three radical enhancements—the History palette, editable text, and profile-based color management—easily make it more essential than version 3.0 (hailed for its introduction of layers) was in its time. Add to those, spot-color separations, layer effects, improved color indexing, path transformations, magnetic selection tools, and a wealth of new shortcuts, and you have what I consider to be one of the most significant upgrades in the history of the Mac.

Perhaps the greatest indication of the sheer breadth of this revision is that I've left out several features for lack of space, including additional gradient styles, a more sensitive Actions palette, a freehand path tool, better support for 48-bit images, and new file-saving options for Web and cross-platform users.

If you skipped Photoshop 4.0, you now have a compelling reason to adapt to the new interface. And if you already use version 4, there isn't a reason on earth not to upgrade. The revised Color Settings commands may trip you up a bit at first, but otherwise it's all smooth sailing. Photoshop 5.0 is simply the best. **m**

Contributing editor DEKE McCLELLAND is the author of *Macworld Photoshop 5.0 Bible* and the upcoming *Photoshop 5.0 Studio Secrets* (both IDG Books Worldwide, 1998). You can visit his Web site at www.dekemc.com.

Navigating the New Keyboard Shortcuts

PHOTOSHOP HAS LONG OFFERED HUNDREDS OF SHORTCUTS FOR ACTIVATING TOOLS AND choosing commands from the keyboard, most of which translate seamlessly between the Mac and Windows. This table lists 30 key operations that Adobe has added or changed in Photoshop 5. If an item in the middle column includes an asterisk (*), then the shortcut produces the same effect as it did in Photoshop 4—the new way is merely an alternative. Otherwise, the old shortcut produces a different effect, and you should use the shortcut in the right-hand column.

Operation	Old Photoshop 4 Shortcut	New Photoshop 5 Shortcut
Hide or display menu bar when viewing image in full-screen mode	none	shift-F
Scroll image left or right in window	none	⌘-shift–page up or ⌘-shift–page down
Switch between rectangular and elliptical marquee tools	press M	shift-M
Select arrow (path selection) tool	press P	press A
Select airbrush tool	press A	press J
Create new layer	click on page icon in Layers palette*	⌘-shift-N
Clone layer as you move it	none	⌘-option-drag outside selection with any tool
Edit text layer	none	click on letter with type tool
Increase or decrease size of selected text	none	⌘-shift-> or ⌘-shift-<
Expand or tighten tracking/kerning	none	option–right arrow or option–left arrow
Align text left, center, or right	none	⌘-shift-L, ⌘-shift-C, or ⌘-shift-R
Exit type dialog box	press enter on keypad*	⌘-return
Restore last selection	none	⌘-shift-D
Feather selection	⌘-shift-D	⌘-option-D
Replay last transformation	none	⌘-shift-T
Change opacity of floating selection	press number key	⌘-shift-F, then enter new Opacity value
Select measure tool	none	press U
Select smudge tool	press U	shift-R
Measure angle between lines (protractor function)	none	option-drag end of line with measure tool
Select Multiply or Screen blend mode	none	shift-option-M or shift-option-S
Restore Normal blend mode	none	shift-option-N
Cycle forward or backward through blend modes	none	shift-plus (+) or shift-minus (–)
Select color sample tool	none	shift-I
Create fixed color target when working in dialog box	none	shift-click in image window
Delete fixed color target	none	option-click on target with color sample tool
Create new spot-color channel	none	⌘-click on page icon in Channels palette
Undo or redo operations beyond last one	none	⌘-option-Z or ⌘-shift-Z
Select history brush	none	press Y
Select pencil tool	press Y	press N
Revert selection to source state in History palette	none	⌘-option-delete

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	VisionMaster Pro 501 (19.5" VIS)	0.28mm/AG	96khz	1600 x 1200@75hz	$1,139
	VisionMaster 502 (19.5" VIS)	0.27mm/dp	110khz	1800 x 1440@74hz	$1,199
	VisionMaster 501 (19.5" VIS)	0.27mm/dp	96khz	1600 x 1200@75hz	$1,139
19"	VisionMaster 450 (18.0" VIS)	0.26mm/dp	102khz	1600 x 1200@80hz	$799
17"	VisionMaster Pro 17 (15.9" VIS)	0.25mm/AG	92khz	1600 x 1200@74hz	$579
	VisionMaster 17ES (15.7" VIS)	0.26mm/dp	86khz	1600 x 1200@69hz	$569
	VisionMaster 17 (15.7" VIS)	0.26mm/dp	86khz	1600 x 1200@69hz	$488
15"	VisionMaster 350 (13.7" VIS)	0.28mm/dp	69khz	1280 x 1024@60hz	$248

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PC Magazine Best of 1997 — January 6, 1998, VisionMaster Pro 17

Catalyst Labs — *Perfect Five-Star Rating*, January 1998, VisionMaster 450, VisionMaster Pro 500

ComputerLife — *Perfect Five-Star Rating*, November 1997, VisionMaster Pro 17

Reseller News — *Performance & Technical Excellence*, March 1997, VisionMaster Pro 21

MW Editors' Choice — *Six Time Winner*, Jan 1997, Feb 1997, March 1997, April 1997, May 1997, June 1997, VisionMaster Pro 21

PC Magazine Editors' Choice — October 7, 1997, VisionMaster Pro 17

Catalyst Labs 4½ Star Rating — March 1997, VisionMaster Pro 21

PC World Best Buy — *Six Time Winner*, July 1996, Jan 1997, March 1997, July 1997, Sept 1997, Jan 1998, VisionMaster Pro 17, April 1998, VisionMaster 450

WEB DESIGN'S NEW

Dynamic Duo

Adobe and Macromedia Come to Web Artists' Rescue at Last

CHRIS LENSCH

by Jason Snell

The Web may not be the rough-and-tumble frontier it once was, but you wouldn't know that by looking at a Web designer's toolbox. Web-site designers still rely on a mishmash of programs to create the billions of GIF and JPEG images that make the Web worth seeing. Sure, Adobe Photoshop lets you touch up graphics and create text, but by itself, it's no Web production powerhouse. Designers augment it with a slew of stand-alone programs, plug-ins, and shareware just to do daily tasks.

Web designers have been waiting for a tool that combines the image-editing power of Photoshop with features that address the unique needs of graphics destined for the Web. Their wish may have finally come true. Two superheroes of the graphics-software world, Adobe (www.adobe.com) and Macromedia (www.macromedia.com), have just announced all-in-one Web-graphics packages—Adobe's $299 ImageReady and Macromedia's $299 Fireworks. The programs, both due out early this summer, were still in beta testing when *Macworld* took them for a test run, but they were complete enough to show us that the days of creating Web graphics on a wing and a prayer are over.

Different Strokes

Whether you create images yourself or get them from an art department, all graphics must be specially prepared for the Web. Photoshop is the standard for image manipulation, so it's no surprise that ImageReady and Fireworks both bear it a striking resemblance. ImageReady offers a slimmed-down version of Photoshop's toolbox (the airbrush and clone tools are missing, among others), and comes complete with familiar Photoshop-style floating palettes. Fireworks provides a similar toolbox and a series of floating palettes.

Beneath the interfaces' surfaces, however, you'll find some fundamental differ-

ences. For instance, both programs let you use brush effects, such as a paintbrush or pencil, but with Fireworks you don't paint with a Photoshop-style spattering of pixels. Instead, effects are contained in editable Bézier curves, just like the curves you create with an illustration program such as Macromedia FreeHand.

Drawing paint strokes that are actually paths will seem strange to longtime Photoshop junkies, but there's a distinct advantage: paths are editable. That means you can go back later and change any attributes of the stroke, such as its color or texture. ImageReady, in contrast, works just like Photoshop does—when you paint, you're essentially brushing on permanent pixels.

These different approaches can be traced back to the two programs' roots. ImageReady's features reflect a close connection to Photoshop. (Keyboard shortcuts are the same, and the proprietary Photoshop format is its default file format.) On the other hand, Fireworks was made by the programmers who wrote FreeHand. Photoshop users will probably feel more comfortable using ImageReady.

Ready for the Web

Paint and touch-up features are vital elements of any image-editing program, but they're not what will make Fireworks and ImageReady must-have tools. What will are the features that help Web designers do the nitty-gritty work of optimizing images for display in a browser.

The trickiest part of preparing an image for the Web is preserving its quality while saving it in a format (traditionally GIF or JPEG) supported by a browser. GIF images contain only up to 256 colors, and each extra color adds to the file's size, so it's important to create a palette that's both accurate and small. JPEG images can be saved at various levels of compression, but you must trade image quality for increased file-size savings. Both ImageReady and Fireworks can help designers figure out which tradeoffs they're willing to make.

Before and After To help you make those decisions wisely, ImageReady lets you switch between the editable version of your image and a preview of what it'll actually look like on the Web. To see the before and after versions, you simply flip between the Original and Optimized tabs of the image window. As you alter an image's characteristics, a single click lets you see how your new settings affect the image's quality and file size. You can compare the results of multiple settings possibilities only by duplicating the image. Menu commands also let you view what your image will look like on a PC monitor and when dithered by a browser.

ImageReady also gives you supreme control over an image's color palette—a helpful feature if you're carefully editing a GIF image that contains very few colors. You can replace one color with another or even shift colors selectively (mixing, for example, colors from the Web-safe palette with others from an adaptive palette). This will be satisfying if you want to eke out every last byte of file-size savings, but for many Web-graphics creators, it's probably overkill.

Myriad Views Fireworks handles the process of putting files in Web-ready formats differently. Instead of before and after views of your image, when you choose Export from the File menu, a window pops up that lets you quickly view the results of up to *four* possible ways of saving your file. (See the screen shot "No More Guessing Games.") By eyeballing all these export-format scenarios at once, you can directly compare file sizes and image quality to choose the settings that strike the best balance.

A Feast of File Formats Both programs offer file-export options far beyond what's been readily available to designers. Besides their powerful features for creating GIF and JPEG files, they also open Photoshop, TIFF, PICT, and most other common image-file formats and can export files in PNG—a new, flexible image format that's gaining popularity on the Web.

Feature Face-off: How ImageReady and Fireworks Compare

	Adobe ImageReady	Macromedia Fireworks
Image-editing tools	All tools are pixel-based: paintbrush, pencil, and eraser.	Tools are vector-based by default: paintbrush, pencil, airbrush, rubber stamp, eraser, Bézier pen.
Special image-editing effects	○	Brush paths can be edited. Can paint with textures, such as sand.
Supports Photoshop plug-ins	●	●
Supports layers	●	●
Text remains editable	●	●
Text can be placed on a path	○	●
Text preview options	Live preview within image window.	Previews available within image window or a text dialog box.
Special text options	○	Special effects applied to text (such as a drop shadow) remain applied even after text is edited.
Export preview options	Previews "before" and "after" of one image-setting possibility. You can preview more only by copying image.	Previews as many as four image-setting possibilities simultaneously.
Special export preview options	Can toggle between PC and Mac monitor gammas; can preview browser dithering.	○
Can save export settings	●	●
Allows direct editing of GIF color palettes	Can mix adaptive and Web palettes; can add and subtract individual colors.	○
Tweening animation tool	●	○
Support for JavaScript-based rollover effects	○	●
Batch-processing capabilities	Available from within application; can also create "droplets" for batch processing from the desktop; no AppleScript support.	Available from within application; no AppleScript support.
Image-map support	●	●
Multiple undos	●	●
Can import and export layered Photoshop files	●	Import only.

● = *yes*, ○ = *no*.

Unfortunately, you can't save Fireworks files in Photoshop format.

Although ImageReady's file-export features are a big improvement over those in Photoshop 4 and although ImageReady offers finer control of color palettes, Fireworks' ability to preview the results of several export settings simultaneously will probably pack the widest appeal.

Letter-Perfect Text

One of the biggest bugaboos of Web graphics has been creating (and re-creating ad infinitum) text. Photoshop automatically rasterizes text into pixels, thus making the letters uneditable. If you misspell your company logo, you must remake everything from scratch, trying all the while to match your original font, point size, and styling. Photoshop 5 remedies many of these problems (see the feature "Photoshop Pumps Up," elsewhere in this issue) by finally making text editable, but whether or not you're rushing to upgrade, you'll be glad to know that Fireworks and ImageReady also offer this attractive capability.

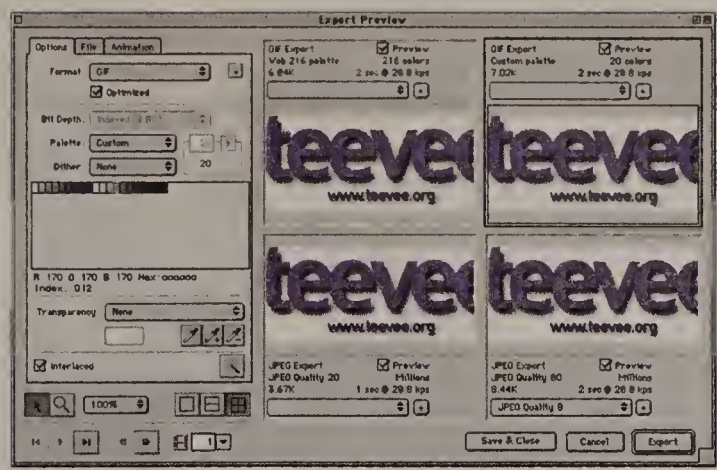
Both programs let you edit text, and both update your text in the image itself as you type, giving you immediate feedback. Unlike ImageReady, Fireworks allows you to apply different font styles to individual letters in a text block.

Effects on Demand Fireworks offers one unique text feature: special effects (such as glows and drop shadows) that remain linked to blocks of text even *after* you edit the text. In ImageReady—and Photoshop, for that matter—you must rasterize text, making it uneditable, before you can apply an effect. If you change the text, the effect is lost. To get the same look, you must remember which type settings you used *and* repeat the whole process. Fireworks saves you the pain of such labors. Fireworks also lets you attach text to any path, letting you quickly flow text across free-form curves. ImageReady creates text that can run only on a straight line.

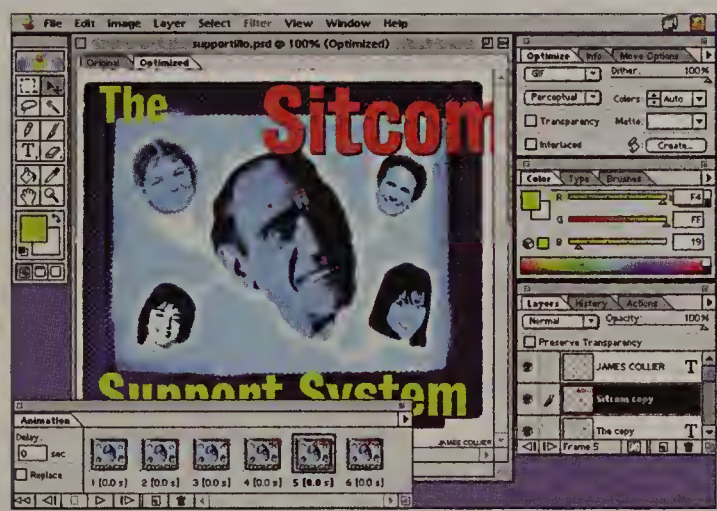
When it comes to text tools, Fireworks appears to have a clear advantage over ImageReady, but both tools offer features that Web authors would have killed for before the release of Photoshop 5.0.

Look Alive

If you've ever tried to use Photoshop as a GIF-animation tool, the animation features in these programs may make you jump for joy. The applications' different approaches make each one better suited for specific types of animation.



No More Guessing Games Say good-bye to guessing which file format and compression scheme will make your graphic look its best. Fireworks allows you to compare the image quality and file size of up to four versions side by side.



Advanced Animation ImageReady's Tween command gives you the ability to quickly generate animations. All you have to do is make "before" and "after" frames, and ImageReady will automatically create all the frames in between.

Drawing on its Photoshop heritage, ImageReady treats layers as sacred, even across different frames of an animation. For example, when you create a multiobject, multiframe animation, a change you make to one layer will automatically carry over to that layer's counterpart in all other frames. This is a big time-saver if, for example, your company's marketing department decides that your animated text logo should be blue and not red—you won't have to correct every frame.

If you create animations that involve static images fading in and out or moving around, you can also use ImageReady to automatically make an entire animation through *tweening*—generating all the frames in between "before" and "after" frames. (See the screen shot "Advanced Animation.")

Fireworks' animation features are more basic. The program doesn't offer any tweening or other special animation features, so simple fade and movement effects will take more time to create. However, it may be more appropriate for people who create animations with multiple cels.

Roll Over, ImageReady Although Fireworks stumbles with complex animation, the program outdoes ImageReady when it comes to support for one hot Web design technique—image rollovers. Rollover effects, such as a button that changes when viewers move their cursors over it, are a common device for providing feedback and animation on a page.

To create this effect in Fireworks, you simply make the original button in one frame and the version that appears when a cursor passes over it in the next frame. Fireworks' ability to apply effects directly to objects (including editable text) makes the program ideal for creating subtle rollover effects quickly. When you're finished, you export your image as a button. Fireworks automatically generates image files for each button state and writes code to create the rollover effect. There's no clear winner between these two programs when it comes to dynamic effects.

The Last Word

Fireworks and ImageReady offer impressive feature sets, but it's still too early to tell which will dominate the field. If you're comfortable using path-based draw tools and you work a lot with text, Fireworks will have a clear edge. If you're more comfortable with the traditional feel of Photoshop and spend a lot of time creating Web animations or perfecting color palettes, ImageReady will be hard to beat.

Whichever tool comes out on top, the clear winners are Web designers themselves. For too long, they've had to jump through hoops because nobody had written a graphics program just for them. With the introduction of Fireworks and ImageReady, those days are over. **m**

Senior Associate Editor JASON SNELL has edited hundreds of GIF and JPEG files since he began creating Web sites in late 1993.

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Secrets

Getting Through Custom Installs

GET THE FILES YOU WANT EVEN WHEN THE INSTALLER REFUSES TO GIVE THEM UP

by Ted Landau

Frustration is often what you get when you try to locate a particular file on a Mac OS system-software CD-ROM. To get the single file you want, you may have to install (or reinstall) a bunch of software you don't want. That's if you're lucky. If you're unlucky, you won't find the file at all. Sometimes you'll be barred from even launching the installer. Don't despair. Here's how to avoid such roadblocks.

PAUL ZWOLAK

The Easy Way

Apple now uses a utility called Mac OS Install to coordinate the installation of system software. Although this utility can be more hindrance than help if all you want is a specific file, using it can also be the easiest and most reliable way to install a file.

The way to use Mac OS Install to install a file is pretty straightforward. Just make sure you select Customize in the Install Software window, uncheck every item except for the software installer you believe contains the file you want, and then navigate to the desired file.

One problem you may run into is not being able to find the file you want. That could be because the file is grouped within an item that contains several files. For example, Apple CD Audio Player is hidden within Mac OS Installer's CD-ROM item (under the Multimedia heading). To get a list of all the files contained within an item, click on the "i" (info) button next to that item's name.

The Time-Saver

Mac OS Install insists on a time-consuming damage check of your disk every time you begin to install something. If you've recently verified your disk (as you can with Disk First Aid), don't bother with this recheck. Instead, bypass Mac OS Install altogether. To do this on the Mac OS 8.1 CD-ROM, follow these steps:

1. From the Finder, open the folder called Software Installers, inside the folder called Full Install Pieces. Here you'll find separate installers for each component of the Mac OS (the actual Mac OS 8 Installer is buried still deeper in the System Software folder).
2. You can launch most of these installers separately right from their desktop location.

continues

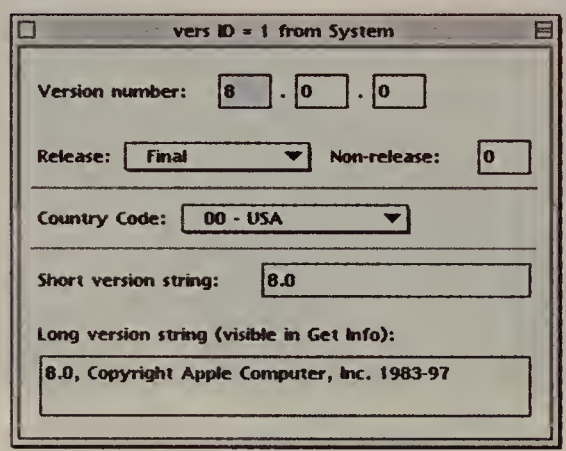
When the Installer Balks

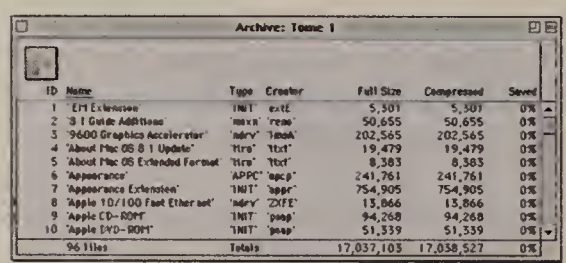
Sometimes, an installer will refuse to open. This can happen if the installer is for a Mac OS version older than the OS currently on your start-up disk. You should be able to get around this by holding down the option key while launching the separate installer. Chances are you'll be taken directly to the installer's Custom Install window. You still won't be able to switch to an Easy Install, but at least you'll have access to all the Custom Install options.

Fool the Installer

Some installers balk at opening even with the option-key method. For example, Open Transport 1.3 Installer won't launch unless you're running Mac OS 8.1 or later on your start-up disk (even though the Open Transport software reportedly runs fine in Mac OS 8.0). If you have one of these especially reluctant installers, fool it into thinking you're running the system-software version it expects. Here's how:

1. Make a duplicate of your System file, and drag it out of the System Folder to the desktop.
2. With Apple's ResEdit utility, open the System file that's still in your System Folder. (You'll get a warning that Apple does not recommend that you do this. Ignore it. As long as you follow these instructions, you'll be OK.)
3. Open the vers item, and open each of the two resources listed.
4. The top line of each should read, Version Number, followed by three boxes that together contain the actual version number (see "Never Say Never"). Change the number to the version the installer expects to see. For example, to get Open Transport 1.3 Installer to run, change 8.0.0 to 8.1.0.
5. Save the change, and quit ResEdit.
6. Launch Open Transport Installer. It should now work.
7. After the installation is complete, change the version number back to its original number.
8. Restart, and make sure everything is working as expected. If so, you can delete the backup copy of the System file on your desktop.





Never Say Never If your installer refuses to launch because you have the "wrong" version of system software, you can use ResEdit (top) to change the version number of your System file. Or you can use TomeViewer (bottom) to ferret out the file you want.

Entering the Tomes

If none of the preceding tips have yielded success, it's time for the ultimate blockade-buster: TomeViewer. TomeViewer is an Apple utility designed primarily for developers but available to the public. You can download it from www.macfixit.com/library/r-z.shtml#tomeviewer or from www.macworld.com/more/.

With most system software, files to be installed are stored within special files called tomes. You typically need an installer to get inside a tome, because the contents aren't accessible from the Finder. (Also, it's best to use an installer to install these files—if you can—because the installer makes sure files are placed in their correct folders and may also perform important hidden actions such as modifying the System file or installing an invisible file.)

However, sometimes it's impossible to use an installer to find what you want. (For example, Mac OS 8.1 Update Installer has no Custom Install option. Period.) This is when TomeViewer comes to your rescue:

1. Launch TomeViewer.
2. Select the Open command, and open Mac OS 8.1 Update's Tome 1. You'll be greeted with a complete list of every file in the update (see "Never Say Never").
3. Click on the file you want, and select Expand from the Archive menu to extract it.

Warning: TomeViewer is unsupported betaware, so use it at your own risk.

Wrapping Up

The next time you want to extract a particular file from your Mac OS CD-ROM, don't take "no" for an answer. With the tips described here, no file should be out of your reach. If you want tips on getting rid of a file, see the addition to this article at www.macworld.com/more/. **m**

Contributing editor TED LANDAU offers more tips at MacFixIt (www.macfixit.com). He is also the author of *Sad Macs, Bombs, and Other Disasters* (Peachpit Press, 1997).

Dirty Little Truths about Clean Installation

THE MAC OS INSTALL UTILITY WALKS you through most of the steps for installing your software. Still, there are two important choices during the process.

Clean Install? If you believe that your system software is damaged or if an Easy Install has led to problems, you'll want to do a Clean Install. The option, if it's available, appears in the screen where you select a Destination Disk. A Clean Install creates a new System Folder containing only Apple software. The old System Folder, with all your third-party software, still remains. You then drag whatever third-party software you intend to keep from the old folder to the new folder. You may want to drag in some Preferences files as well. When that's done, you can delete the old System Folder.

Update Hard-Disk Drivers? Click on the Options button in the Mac OS Install window, and one of the choices is Update Apple Hard Disk Drivers. It's generally a good idea to leave this checked. However, if your start-up disk was formatted with a driver other than Drive Setup, you may want to turn the option off. This prevents Apple's Drive Setup driver from possibly overwriting your existing third-party driver.

Spotlight on Creativity

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SPECIAL ADVERTISING SECTION

An Open Letter to The Macintosh Community

Over the course of the several months Apple has encouraged us all to Think Different, as the company itself has started doing things very differently: A return to consistent profitability, the release of the best-selling G3 Power Macintoshes and the recent introduction of the world's fastest and most stylish portables have marked a definite change in Apple and the Mac's fortunes.

We at *Macworld* Magazine are excited by all the positive changes at Apple and the incredible strides the Mac has made, and are ready to join with the rest of the Macintosh community to celebrate the Mac's achievements. That's why we're glad that MACWORLD Expo is thinking different with the debut of MACWORLD Expo in New York.

Brimming with native energy and creative spirit - not to mention attitude - New York City is the perfect backdrop for the annual summer gathering of Macintosh users. The Big Apple is a hub for the creative industries that drive the Mac market - print, Internet, performing arts, video, music, graphics and design - which makes it an ideal stage on which Apple and Mac developers can display new products and technologies. And what better place to celebrate the Mac's success than in The City That Never Sleeps?

For our part, *Macworld* Magazine will be all over the show - from the Macworld Live theater on the show floor to Macworld's Best of Show, where we will pick the cream of the crop of new products debuting at the Expo.

I hope you will be able to join us as we get the latest on the best the Mac has to offer. It should be informative, entertaining and, perhaps, even surprising.

Sincerely,

Andrew Gore
Editor-in-Chief
Macworld Magazine

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Macworld EXPO the Creative World

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For the latest information on these special events, appearances, & hands-on opportunities, visit the MACWORLD Expo Web site at

www.macworldexpo.com/mwny98/attractions/frame.html

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- ❑ 51. Other ____

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Quick Tips

Tips, Tricks, and Shortcuts

by Lon Poole

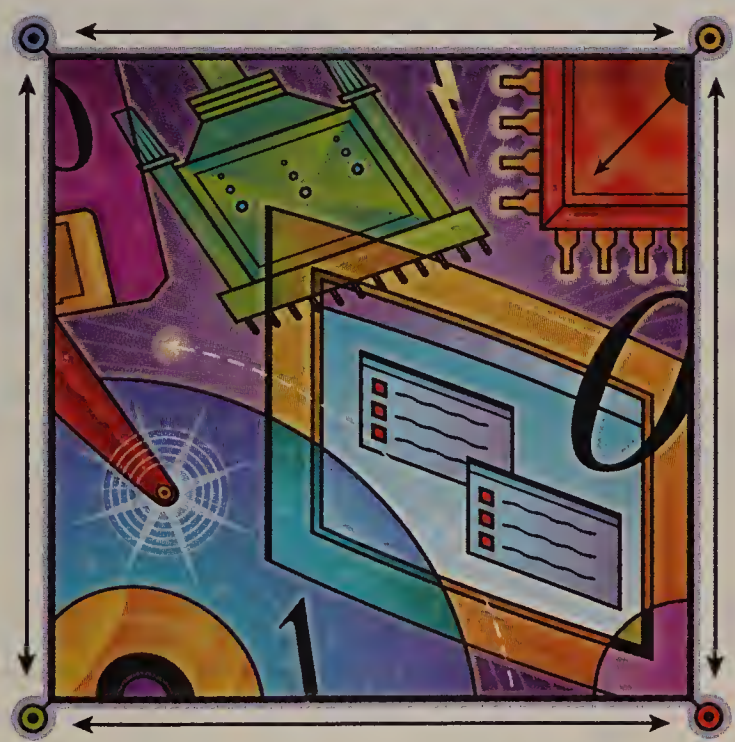
When desktop printing breaks down, this otherwise very convenient tool can turn into an aggravation. David Haseman of Hanover, New Hampshire, and David Burdige of Norfolk, Virginia, both suffered the same desktop-printing problem: during start-up, an alert box reported "Desktop printer unknown error –192 at 18." They dismissed the alert by clicking OK, and luckily nothing else went wrong. This alert is caused by a corrupted print request. To fix this problem, use the Extensions Manager control panel, Casady & Greene's Conflict Catcher, or another equivalent utility to disable the Desktop Printer Spooler and Desktop PrintMonitor, which are located in the Extensions folder. Restart your Mac, and a new message will report a damaged print job. Click OK to get rid of it, re-enable Desktop Printer Spooler and Desktop PrintMonitor, and restart again. If you have other desktop-printing problems, check out article 24306 of Apple's Technical Information Library (http://til.info.apple.com/techinfo.nsf/artnum/n24306) for step-by-step fixes.

Sorting Emailer Lists

Q. Thanks to its inadequate documentation (a common frustration with bundled software), I can't figure out how to sort the addresses in Claris Emailer Lite, which came with my Power Computing PowerTower Pro. Claris no longer supports Emailer, and I can't get a response from Apple. How can I sort my addresses?

JERRY ENGELBACH
Brooklyn, New York

A. To reverse the sort direction, click the triangular sorting control just above the vertical scroll bar. To sort by a different column, click on its heading. These basic sorting methods also work in Emailer 2.X's windows that list addresses or messages, in Emailer Lite 1.X's Browser window with any tab selected, in various Mac OS 8.X control panels, and in OS 7.X and OS 8.X's folder and disk windows in list views.



Mastering Modem Maneuvers

Q. My dad and I have an AppleTalk network set up in our house. His computer has a modem and mine doesn't. How can I use his modem to connect to the Internet over the AppleTalk network? Also, how can I network modem-to-modem with a friend who has a Mac? Or a friend with a PC? And is there a book that will teach me the internal workings of the Mac OS, such as how to make a program link with another program via AppleTalk?

CHARLIE ICE IV
Midland, Texas

A. Two computers can access the Internet through one connection with Vicom Technology's $99 Surf-Doubler (650/691-9520, www.vicomtech.com). Three or more computers can share a single Internet connection with Vicom Internet Gateway ($249 and up, depending on the number of users you want to share the modem simultaneously) or Sustainable Softworks' $89 IPNetRouter (www.sustworks.com). Although these three programs run on a Mac, they also allow non-Mac computers connected to the same Ethernet or LocalTalk network to share the same modem, ISDN line, or cable modem.

IPNetRouter has a cryptic interface, making it harder to configure than the others, but it costs less and gets the job done (see "Sharing a Connection"). Vicom Internet Gateway has more features (and a higher price) than the others: it lets you restrict access to Internet sites, comes with a year's subscription to the CyberNot list of potentially undesirable sites, and includes a Dynamic Host Configuration Protocol (DHCP) server to simplify setting up the TCP/IP control panels on your network. It also has inbound mapping and a dial-in PPP server, features that together enable remote computers to access services on your local TCP/IP network.

With any of these three programs running on your dad's Mac, you can access Web sites, e-mail, FTP servers, and other Internet services with the appropriate applications on your Mac. For example, if your friends have FTP servers connected to the Internet, you can

continues

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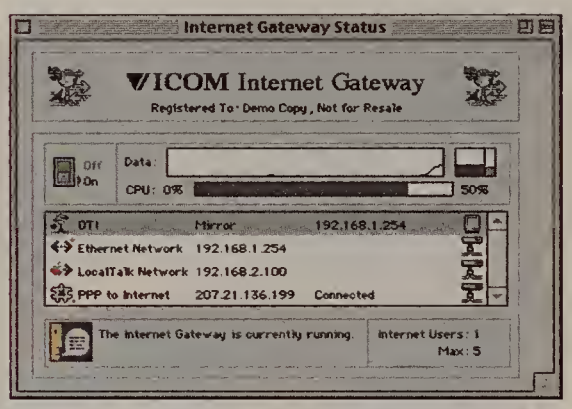
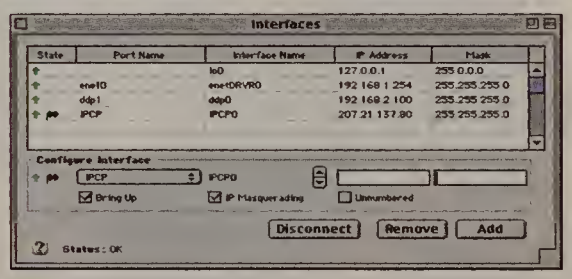
access their files with Fetch ($25 shareware; free from some Internet service providers [ISPs]) or Anarchie ($10 shareware). With Vicom Internet Gateway properly configured, you can run an FTP server program such as NetPresenz ($10 shareware) on your Mac. Then your Mac and PC friends can access folders you've made available using Mac OS file sharing. You set access privileges to each folder with your Mac's Sharing command in the Finder, and you set users' access privileges with the standard Users & Groups control panel.

You can also host a Web site using the Personal Web Server control panel in Mac OS 8. The FTP and Web servers will only be accessible while your computer is connected to the Internet, and the numeric IP address (for example, 207.21.136.225) that your friends use to contact you will change every time you connect unless your dad has a static IP address. Neither SurfDoubler nor





Sharing a Connection Both Vicom Technology's Vicom Internet Gateway (top) and Sustainable Softworks' IPNetRouter (bottom) let you share one Internet connection with multiple users on Ethernet, LocalTalk, and Token Ring networks.

IPNetRouter currently lets you host an FTP site or Web site on the Internet.

If you have a modem on your computer and want to access files on another Macintosh, you can use Apple Remote Access (ARA). One Mac will need Apple's $130 ARA Personal Server program, and other Macintoshes connecting to it by modem or ISDN will need the ARA Client program (included with Mac OS 7.6 and later, and with the ARA Personal Server).

For e-mail, you'll need your own account with an ISP unless you want to share your dad's account—or sign up for a free e-mail address from Yahoo, Excite, or one of the many Web sites offering them.

And since you asked about a Mac OS book, I'd be crazy not to plug mine, *Macworld Mac OS 8 Bible* (IDG Books Worldwide, 1997). Chapter 22 tells you how to link programs, including how to control programs on another computer with AppleScript.

Seeing True QuarkXPress Page Numbers

TIP The page-number indicator at the bottom of the QuarkXPress document window is not always reliable—a real nuisance, especially when you're zoomed in 300 percent and have to zoom out to confirm the true page number.

To quickly see the real page number, type ⌘-3 in any text box. Try scattering tiny text boxes with the page number throughout your document, or position some strategically on your master pages; make sure to set these text boxes to have no runaround and not to print.

FRANCIS GEORGE
Chapel Hill, North Carolina

Eradicating the Defiant

Several readers sent in more methods for getting rid of folders and files that defy the Empty Trash command to add to those mentioned in April's *Quick Tips*.

Ken Ferris of Ketchum, Idaho, was able to delete a recalcitrant folder from his hard drive after restarting from a floppy disk (a Mac OS installation CD should work as well). Peter Russell of Sausalito, California, also managed to exterminate a stubborn folder with the Wipe Info feature of Norton Utilities.

Jim O'Brien of Minneapolis suggests using a compression utility that's set to delete the original item after compressing it. For example, with Aladdin Systems' StuffIt Lite or StuffIt Deluxe, you would create a new archive that includes the stubborn folder, choose Stuff from the Archive menu, and in the dialog box turn on the option Delete Item When Finished.

Other readers suggested rebuilding the desktop, but this is unlikely to

continues

Image created with Inspire 3D

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budge folders and files that can't be deleted. It's a disk's directory—not the desktop files you rebuild—that keeps track of folder contents and file locations on the disk.

SCSI Installation Update

Before installing an additional SCSI internal hard drive as discussed in April's *Quick Tips*, compare the total power requirements of all internal SCSI devices with the available power. Jody Hewell of Cary, North Carolina, wanted to add a Quantum Fireball SE 4GB drive to one of the two empty drive bays in a Power Computing PowerCenter 132, but realized that its 11 watts plus the 17w used by the existing hard drive, internal Zip drive, and CD-ROM drive would exceed the 23w available for SCSI devices on that machine. The 4GB drive had to go in an external case with its own power supply.

And Bob Workman of Fayetteville, New York, was the first to point out a clarification needed for April's *Quick Tips:* two SCSI devices can't have the same ID number, whether they are connected internally or externally—even if the Mac has separate internal and external SCSI buses. Having two separate buses prevents insidious cable and termination problems on the external bus from sapping the performance of SCSI devices connected to the internal bus, but you need a SCSI adapter (a PCI or NuBus card) to connect more than seven SCSI devices to one Mac. **m**

LON POOLE answers readers' questions and selects reader-submitted tips for this monthly column. His latest book is *Macworld Mac OS 8 Bible* (IDG Books Worldwide, 1997).

All shareware and freeware mentioned in *Quick Tips* is available from the Macworld Online software library (www.macdownload.com).

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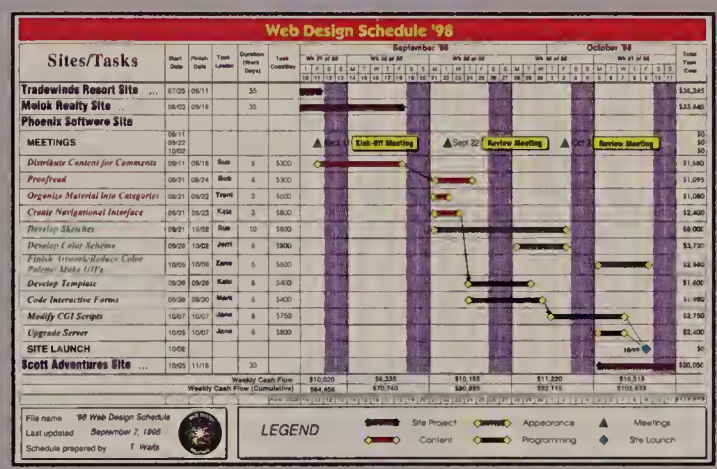

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A Look at FreeHand Lenses

Vector Artists Enter the World of Transparency

by Olav Martin Kvern

Lenses—pieces of glass ground and polished to produce specific optical effects—have a tendency to change the way we think about the universe and our place in it. For instance, think of Galileo looking at the heavens with his telescope, or Leeuwenhoek observing microscopic organisms with his magnifying glasses. Macromedia FreeHand's new lens-fill feature admittedly is not as revolutionary as these earlier inventions, but it'll certainly change the way we think of vector-drawing programs.

FreeHand 8 isn't the first vector-drawing application to try adding transparent fills and strokes to its repertoire—MetaTools Expression and CorelDraw come to mind. FreeHand is, however, the first to add transparent fills that remain "live" (that is, you don't have to turn the filled objects into a bitmap to print them). Best of all, FreeHand prints transparent fills reliably.

A Quick Tour of the Lens-Fill Type

In the real world, lenses alter the appearance of objects viewed through them. Some lenses enlarge, some reduce, and some alter the colors of everything you see through them. FreeHand's lens fills let you create a path that alters the look of elements behind it.

To see the lens fills, display the Fill Inspector (⌘-option-F), and then choose Lens from the Fill Type pop-up menu. Choose one of the six types of lens fills from the Lens Type pop-up menu. If you're comfortable with Adobe Photoshop's transparency modes, you'll find that FreeHand's lenses—with the exception of the Magnify lens—feel very familiar. The difference is that while Photoshop lets you apply transparency effects to an entire layer, FreeHand lets you apply lens fills to a single path.

The Limits of Lens Fills

Lens fills do come with a few limitations that you should be aware of before crossing into this new territory.

- Lens fills don't work with spot colors. When you try to apply a lens fill to a path that's over an area of spot color, FreeHand warns you that the colors seen through the fill will be converted to process colors.
- You can't apply lens fills to type (though you can always apply lens fills to paths that pass over the type)—you must convert the text to paths and then apply the fill to the paths.
- You can't blend paths to which lens fills have been applied.
- You can't use lens fills to make imported bitmapped images transparent (though you can always apply lens fills to paths that pass over the images).

TIP To make an imported bi-level bitmapped image (one that's just black and white) transparent, use the Transparent option at the bottom of the Object Inspector. To make a gray-scale image transparent, apply a Basic fill to the image and then turn on the Overprint option in the Fill Inspector (you won't

continues

An Artist's Guide to Lens Fills and Controls

FREEHAND'S LENS-FILL TYPES

TRANSPARENCY *Transparency, translucency,* and *opacity.* These aren't exact terms—the same object could be described as "partially transparent" or "nearly opaque." When you apply a Transparency lens fill to a path, FreeHand adds a tint of a color you specify to the objects behind the fill. You use the Opacity slider to define the tint. Applying a Transparency lens fill with an Opacity setting of 100 percent is exactly the same as applying a Basic fill of the color you've chosen. Moving the slider to zero percent produces a fill that's completely transparent (why you'd want to do this is beyond me, however).

MONOCHROME The objects behind a Monochrome lens fill appear in tints of the lens-fill color.

INVERT Inverting black objects turns them white, but what happens when you invert a tint of black? FreeHand subtracts the original tint percentage from 100 (for example, 80 percent black becomes 20 percent black). What happens to colors? In CMYK, FreeHand uses new ink values equal to 100 minus the original ink percentage (for example, 40 percent cyan becomes 60 percent cyan). For RGB, FreeHand subtracts the original color value from 255 (for example, a red value of 50 becomes a red value of 205).

LIGHTEN (top) This increases the amount of white in the objects behind the lens fill (in the CMYK color model, this means decreasing the value of each ink by the percentage you enter; for RGB colors, it means increasing each color value).

DARKEN (bottom) This increases the amount of black in the objects behind the lens fill (in the CMYK color model, this adds more black ink; for RGB colors, this decreases each color value by the percentage you entered).

MAGNIFY This scales the objects behind the lens fill. When you're creating an inset view of a map or technical drawing, you can use the Magnify lens fill to display an area in greater detail (particularly if you use the Snapshot option—see facing page).

Printing Lens Fills—the True Story

DRAW PROGRAMS AREN'T MAGIC. They can't go faster than the speed of light, travel through time, or make transparency a feature of your PostScript printer. So how does FreeHand get its transparent lens fills to print? Simple: it cheats.

It's All an Illusion

In previous versions of FreeHand, you could create the illusion of transparency by changing the color of objects where they happened to intersect other objects. Using FreeHand's Paste Inside feature and its path operations (such as Union and Punch), you could do a good job of making things look transparent. FreeHand 8 does pretty much the same thing.

When you print or export a path filled with a lens fill, FreeHand creates copies of the objects that appear inside the path and then pastes these copied objects inside the path. FreeHand adds these extra objects not to your document but to the stream of PostScript the program sends to your printer or to an EPS file.

Lens Fills Increase File Size

FreeHand's lens fills print well because they don't rely on arcane PostScript techniques to create the illusion of transparency in your printer's PostScript interpreter. A drawback to this approach is that "transparent" fills can add lots of new objects to your print job or EPS file, thereby increasing file size significantly.

One key to printing transparent fills is to exercise restraint in using them—especially if you're placing them over imported images. Ask yourself, is it worth doubling the EPS file size to put an image inside a lens fill? If so, go for it; otherwise, resist the temptation.

Tweak Flatness to Speed Printing

It's a good idea to increase the flatness of the paths you've applied lenses to. (The Flatness setting controls how accurately a PostScript interpreter renders curved paths; it doesn't affect paths made up of straight line segments.) Increasing the flatness of curved paths by a small amount doesn't visibly change the paths but does make them print faster.

• To set the flatness for a specific path, select the path, display

FREEHAND'S LENS-FILL CONTROLS

CENTERPOINT Often, objects seen through transparent surfaces appear to shift from their original positions—think about what happens when you see an object behind a glass full of water. That's just what FreeHand's Centerpoint control does—it offsets the objects you see through the lens fill (it doesn't move the objects on the page; it moves the copies of the objects inside the path you've filled with the lens). Turn on the Centerpoint option, and FreeHand displays the centerpoint handle in the center of the lens fill. Drag the centerpoint handle (❖) or enter new coordinates in the X and Y fields to move the center point of the lens fill to a new location.

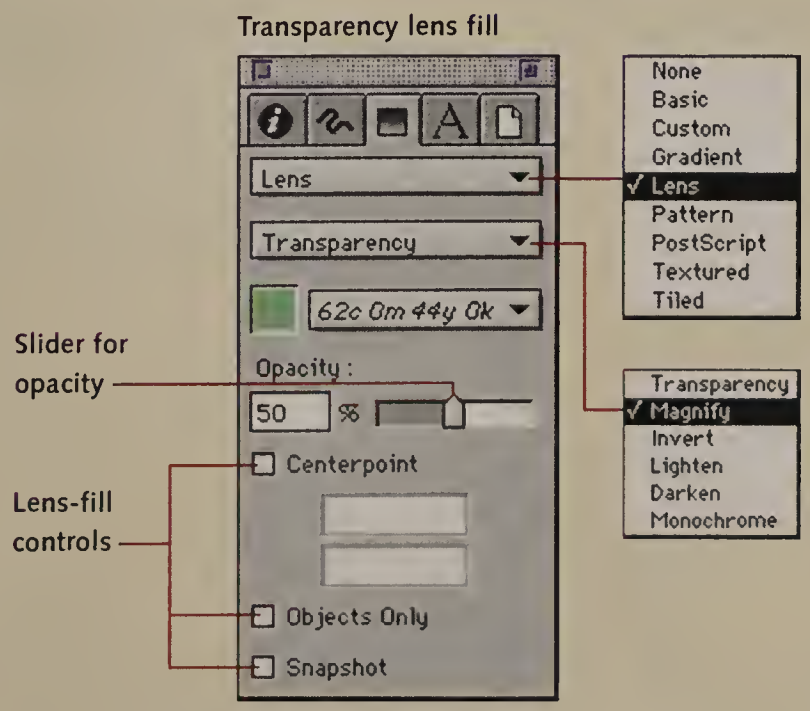
OBJECTS ONLY When you turn on the Objects Only option, FreeHand applies the effect of the lens fill (such as Invert, top circle) to any objects behind the filled path but leaves the page background unaffected (bottom circle). This comes in handy when you're creating shadows—you want the shadow to fall on objects, not on empty space.

SNAPSHOT When you turn on the Snapshot option, FreeHand "freezes" any objects inside the lens fill (top). Move the path, and the "snapshot" moves along with the path (bottom). Used with the Magnify lens fill, this makes it easy to create inset views for maps and technical illustrations.

the Object Inspector (⌘-I), enter a small value (2 or 3) in the Flatness field, and press enter to apply the setting to the selected path.

- To set the flatness for all of the paths in a file you're exporting as EPS, use the Output Options dialog box (choose Output Options from the File menu).
- To set the flatness for all paths as you print a document, press ⌘-P to display the Print dialog box, click on the Setup button to display the Print Setup dialog box, and then click on the Imaging tab (you'll find the Output Options section in the panel that FreeHand displays).

Accessing Lens Fills from the Inspector Palette



In the Inspector palette's Fill tab, choose Lens from the fill-type pop-up menu.

Then choose the lens fill you want from the lens-fill-type pop-up menu.

continued from page 91
see any difference on your screen, but the image will print over anything that's behind it).

Rasterization Fights Lens-Fill Bloat

Lens fills can increase the size of your EPS files. They can also increase the amount of time it takes your FreeHand document to print. This is especially true when you work with overlapping lens fills or when you position a lens fill over an imported image.

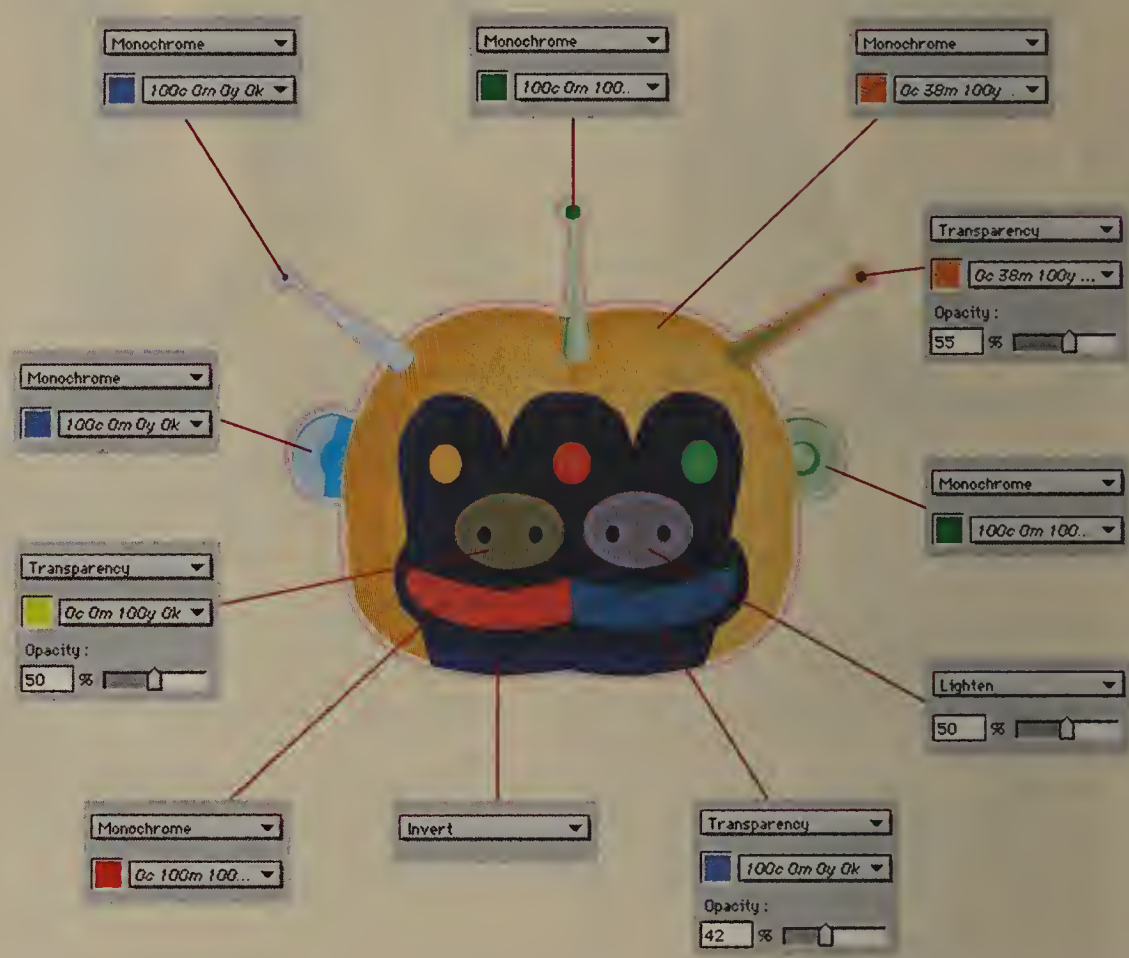
Count on FreeHand's adding a copy of every path, text block, or imported image that's behind a lens fill. If an object crosses two paths formatted with lens fills, you'll get two new copies of the object—one pasted inside each of the paths. For example, imagine working with a single 3-by-5-inch gray-scale image. Cover that image with a 3-by-5-inch rectangle containing a Transparency lens fill, and you double the amount of information in your file.

And when a lens fill overlaps a path filled with a lens fill, look out! Printing can slow to a crawl or a crash. All of the information inside the background path will be copied into the foreground path when you export or print the file, causing the file size to increase exponentially. One way you can deal with the excess is to rasterize (that is, convert to a bitmap) selected paths you've filled with lens fills.

Lens Fills at Work

ARTIST JOHN HERSEY USED FREEHAND 8'S LENS FILLS in creating the art that opens this article. He did the original image in MetaCreations' Infini-D and Adobe Photoshop, imported it into FreeHand, and then used lens fills to give the piece a very different look. The lens-fill settings for each path are highlighted below.

Original image



Is It Time to Rasterize?

Here's a rule of thumb: If the transparent paths take up significantly more disk space than a bitmapped image of the same objects would consume, you should consider rasterizing the paths.

Here's a test that will give you the information you require to decide whether or not to rasterize. Export your lens-filled path and the objects behind it as an EPS file, then check the file's size. Next, select the objects and rasterize them (choose Rasterize from the Modify menu) at a resolution (in dots per inch) that is twice the frequency (in lines per inch) of the halftone screen you intend to use when printing the document. (As an example, for a 150-lpi halftone screen, you would rasterize at 300 dpi.) Use the Object Inspector to view the size of the resulting image. Which is larger—the EPS or the rasterized image?

One other consideration before you rasterize is whether or not it will ruin your image. This is determined by the nature of your artwork—if you're dealing only with type and paths colored with a solid ink (100 percent of a single process or spot color), leave them as vectors. But if you've got a path formatted with a special tint of an ink, you can get exactly the same quality by rasterizing, provided that the bitmap's resolution is at least twice the frequency of the halftone screen you're using. Experiment on copies of your files until you find the approach that works best for you.

The World through Rose-Colored Lenses

My hat is off to the FreeHand engineering team—and not just for the lens-fill feature, as cool as it is. I'm also pleased with the extremely pragmatic and practical tack they took to solving one of vector illustration's most vexing challenges (making a PostScript printer print transparent objects when PostScript itself can't do that). Instead of pioneering a radical new approach, the team looked at what FreeHand users were already doing to create the illusion of transparency and then automated that approach for us. That doesn't mean the feature was easy to implement or that it's anything like perfect. Lens fills come with all the disadvantages of clipping paths (increased file size and slower printing, to name two), but they do let vector artists look at the world in a new way. **m**

OLAV MARTIN KVERN is a software developer, illustrator, graphic designer, and writer. He is the author of *Real World FreeHand 8* (soon to be published by Peachpit Press).

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QuarkImmedia on the Web Frontier

Required: A Little Skill and Lots of Understanding

by David Blatner

The world needs another hard-to-learn, confusing multimedia tool like it needs a hole in the ozone layer. Fortunately, Quark took a simple approach to multimedia in QuarkImmedia. While months of learning are required for some multimedia programs, I've seen XPress users build interactive projects in under an hour with Immedia. Though Immedia can create multimedia projects for CD-ROMs and interactive kiosks, the program's Internet abilities have gained the most attention and hype in the press. Before you plunk down your money, let's separate the hype from reality and consider which Immedia projects make sense for the Internet. I'll even throw in some tricks to make your Web-based Immedia projects run better.

Serving Up Immedia Web Files: Pros and Cons

When it comes to publishing Immedia projects on the Web, there are two issues you should keep in mind: Immedia's Viewer, and bandwidth.

Most people think publishing on the Web means building pages in HTML, a language that Web browsers such as Microsoft Internet Explorer and Netscape Navigator can interpret and display. But Immedia projects are not written in HTML, so ordinary Web browsers can't display them at all. To view an Immedia site, you must use the Immedia Viewer utility, which can read and display Immedia files on disk, on a network, or over an Internet connection.

Although the Viewer is free (find it at Quark's Web site, at www.quark.com), it's unlikely to become as ubiquitous as HTML-based Web browsers. So you need to consider whether your audience has the Viewer already—and if they don't, whether you can force them to download it. (Note that as of this writing, there are technical problems with viewing Immedia projects if you connect to the Internet via America Online or CompuServe.)

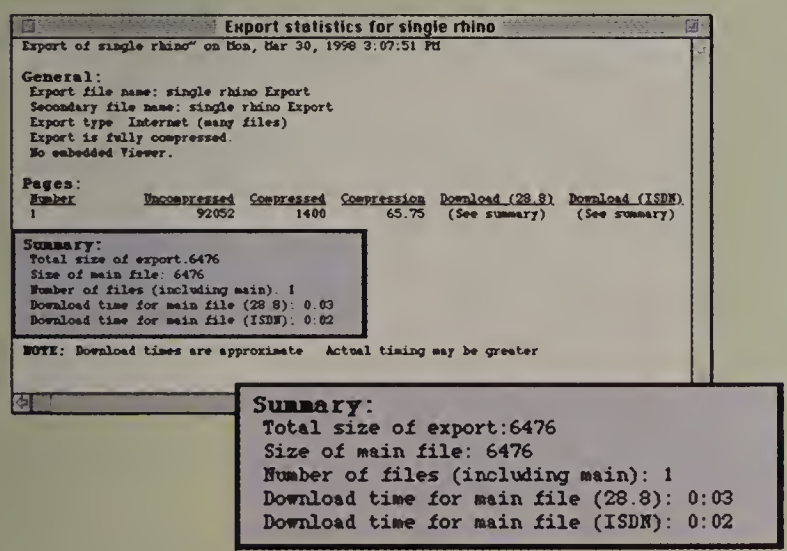
The Network Squeeze

Once you've settled the Immedia Viewer question, you still have to be concerned with bandwidth—a measure of how much information you can push through the wires per second. A standard 28.8-Kbps modem typically handles about two or three thousand bytes per second, so a 100K file will take over 30 seconds to download.

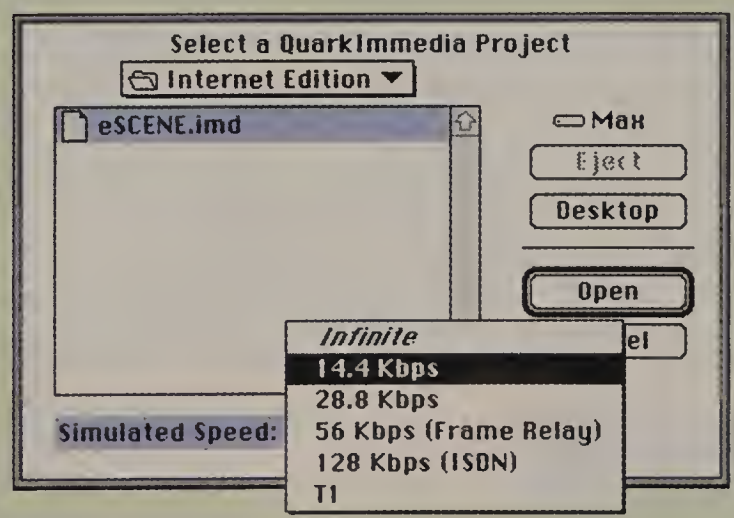
continues

Hidden Tests Simulate Slow Connections

YOUR FINISHED IMMEDIA PROJECT RUNS BEAUTIFULLY ON your hard drive, but how will it perform over a slow modem connection? You might assume that the only way to find out is to upload the files to your Web server, find a modem, hook it up . . . you get the idea. Immedia has two hidden features that make testing for Internet playback much easier.



Export Statistics To display the Export Statistics window, which is filled with information about file sizes, approximate download times, and so on, hold down the option key when clicking on Save in Immedia's Export dialog box. By reviewing this information, you can often get a good idea of how comfortably the average dial-up Internet user will view your project.



Online Simulation You can test projects in XPress, but you get more testing options once you've exported a file. To choose from the Simulated Speed pop-up menu, hold down the option key when selecting Open from the Immedia Viewer's File menu. Choose 28.8 Kbps, and the file you open will load and display as if it were connected over a 28.8-Kbps modem.

Immedia Gratification: Build a Simple Project

IMMEDIA IS ACTUALLY AN XTENSION TO XPRESS—ALBEIT ONE much larger and more expensive than most. With it you can use XPress's familiar tools (text and picture boxes, lines, and guides) to build interactive CD-ROMs, kiosks (like those popular in museums and office lobbies), presentations, and Web sites. And these projects can contain all kinds of interactive elements: animated buttons, movies, sound, transitions.

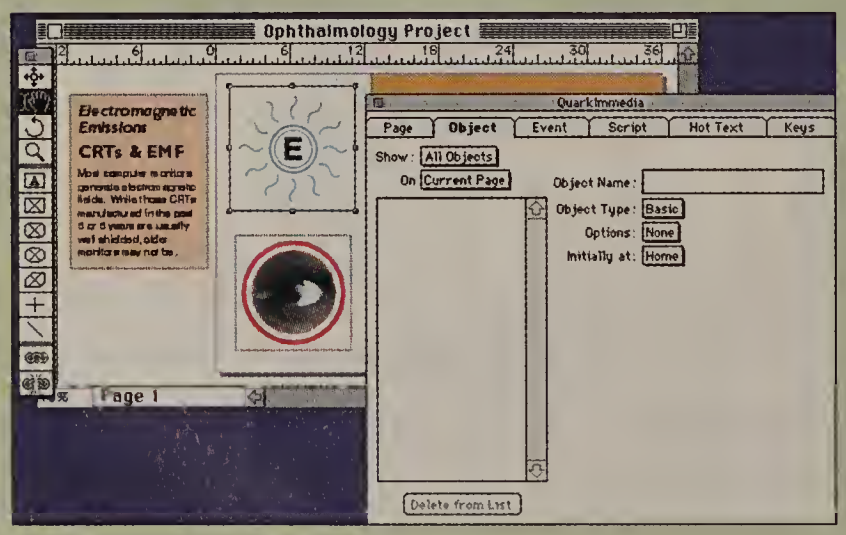
One benefit of using Immedia is that what you see on screen while authoring is just what your audience will see. If you don't like the kerning between two letters, you can adjust it with XPress's powerful typographic tools. Even fonts are not a worry, because Immedia rasterizes them (turns them into a picture) along with the rest of the page.

You can preview your work within Immedia (choose Engage from the QuarkImmedia menu; to get out of Engage mode, press ⌘-Q or F15). The Export feature lets you save a project as a stand-alone file that anyone with the free Immedia Viewer can run.

For XPress users unfamiliar with Immedia, a good way to get the hang of the program is to jump in with a simple project—say, making a window appear on screen. Follow the steps below.

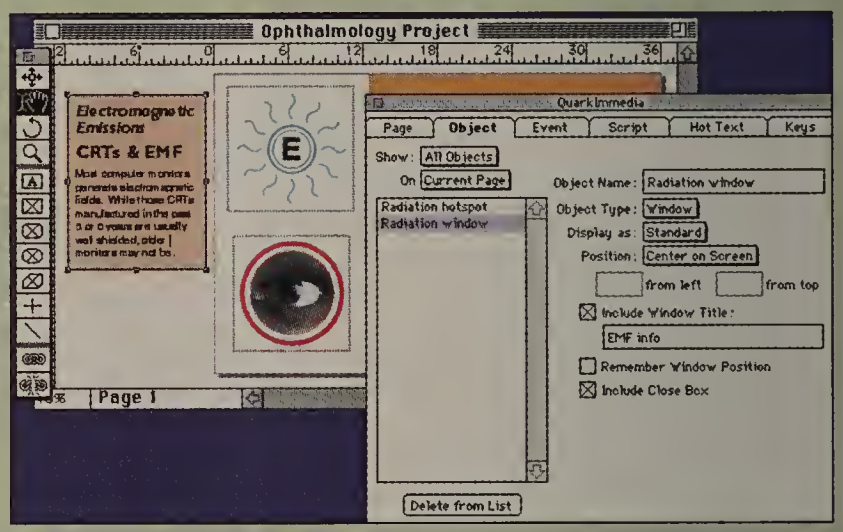
1 Create Objects This is the part you already know how to do in XPress: place pictures and text on your page. Each box or line is a separate object that can do something.

Here there are three objects: two picture boxes on the page and a text box on the pasteboard. Text and graphics that appear in windows always sit on the pasteboard when you're authoring.



2 Identify the Objects If an object is going to do anything other than sit there on the screen, you have to go to the Object tab of the QuarkImmedia palette to tell Immedia what the object is supposed to be. For example, a text box can be identified as a list, a pop-up menu, a window, or an editable text field. You must also give these objects a name (any name). In this case, name the top picture box "Radiation Hotspot" and the text box "Radiation Window."

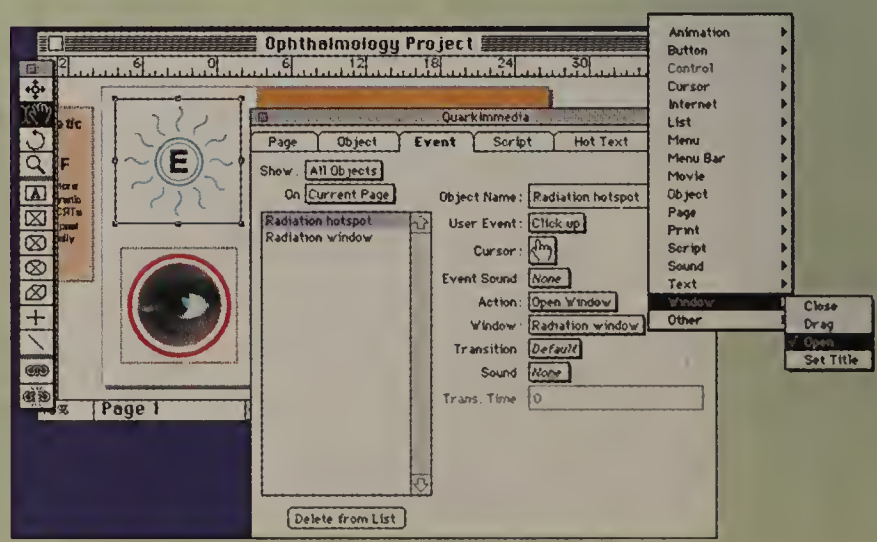
Almost everything in Immedia is controlled by pop-up menus. For each object type, corresponding pop-up menus appear, offering various options for that kind of object. To tell Immedia that the text box should be a window, select Window from the Type pop-up menu.



3 Specify Actions Next, you must tell Immedia what to do with an object by tagging the object with an action—such as Play Sound, Pause Animation, Slide Object, or Run AppleScript—in the Event tab of the Immedia palette.

When you specify an action, you must also specify a user event that triggers that action, such as Mouse Enter (when the cursor is placed over the object), Double-click, and so on. Actions—as well as the various options for each action, such as which sound, which object, how fast to slide it, and so on—are always available in Immedia's pop-up menus.

Select the Radiation Hotspot box, and give it the Open Window action: in the finished project, when the user clicks on the radiating letter *E*, the window with EMF information will appear.



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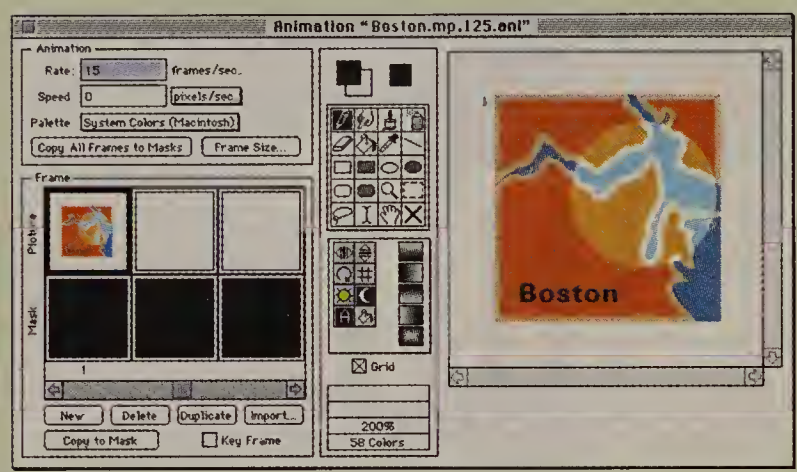
Five Ways to Optimize Immedia Web Projects

AS SOON AS YOU START THINKING OF PUTTING A PROJECT ON the Internet, you should begin considering how to make the project as compact as possible. Try these practical tips for keeping Web-based Immedia projects small.

Cache Your Graphics If you have a picture or logo that repeats throughout your project, consider turning it into a single-frame animation. Animations get cached the first time the Immedia Viewer downloads them, so even if you use the same graphic on every page, it still gets downloaded only once. (A single-frame animation doesn't actually animate, because it has only one frame.) Immedia's Animation editor lets you import various animations or build them from scratch.



Use single-frame animations for simple graphics that repeat.

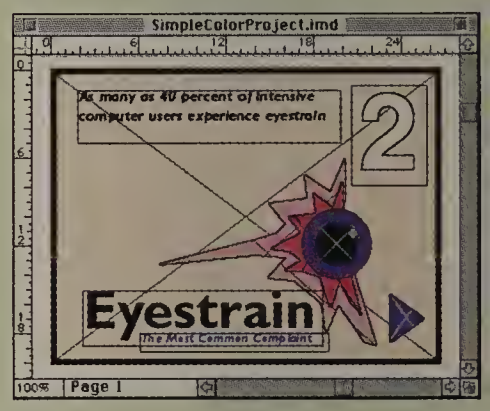
Build Dummy Projects If you think people will be jumping to your Immedia project from an HTML site (using a Web browser), create a tiny, single-page project that downloads quickly and simply reads "Loading Project." Include a start-up script with the Open Project action that immediately bounces people from this little project to your real project. When the Web browser hits this dummy project, it quickly downloads the project to your disk and launches the Immedia Viewer (if the Preferences are set up properly).

Use MIDI Sounds Since Immedia is already plugged in to QuickTime, you can easily use MIDI sounds built into audio-only QuickTime movies instead of regular sound files. MIDI is extremely efficient at playing sounds, and QuickTime (for Mac and Windows) can decipher it (you need QuickTime to run Immedia projects anyway). However, MIDI can play only instrumental music, not voices.

Repeat Your Buttons Use the same buttons throughout your project. QuarkImmedia caches buttons, so even if you use a single button 30 times in your project, the Viewer has to download it only once.

Use Flat Colors Think of each page in your project as a giant GIF image. Immedia compresses rasterized Immedia pages in much the same way that the GIF format compresses images. That means that areas of flat color compress much better than areas containing blends or highly detailed scanned images. Solid colors always compress the best, while natural images (such as scans) and blends usually compress poorly. The top screen contains a scanned image that makes the file large. The bottom screen produces similar information with flat colors. The payoff for creating a screen like the bottom one is a much smaller file.

The size of this file is 118K.



The size of this file is 7.3K.

Quark can't overcome the laws of physics; Immedia is not performing magic behind the scenes. If your movie or sound file would make an Acrobat PDF file or HTML file too big for the Internet, you shouldn't include it in an Immedia project, either. Nonetheless, it is possible to make small Immedia projects that even dial-up–modem users can use without tearing their hair out. You just have to be careful.

Ultimately, Immedia makes the most sense for projects where bandwidth is not a big issue. An intranet, for instance, running over an office's Ethernet network is a phenomenal place for Immedia projects because of the very fast network speed. In fact, you could build an office's entire intranet with Immedia and bypass HTML pages and Web browsers entirely.

Hybrid Projects

These restrictions may leave you wondering why you would use Immedia on the Internet at all. The best reason is that you can use a familiar tool (XPress) to design your pages exactly the way you want them to appear to your audience. One way to avoid the restrictions of bandwidth and the Viewer is to build hybrid projects that combine CD-ROMs and the Internet.

For instance, you can easily split up an Immedia project so that your fixed, large data (movies, sounds, animations, and so on) sits on a CD-ROM while data that changes over time sits on an Internet site, waiting to be downloaded. A project built for teaching music appreciation might come on CD-ROM but also have an Internet component that allows users to grab an ever-changing concert schedule and plant it in the right place in the project.

Immedia projects can also let users send data the other direction. By creating a project that submits "form" information to a CGI script running on a Web server, you could, for instance, enable your audience to sign up for a mailing list or order products from an online catalog.

No Free Lunch

When you publish an HTML file on the Web, you never know how it will appear to your audience. Most people will lack the fonts you've used. Others will have altered their Web browsers to display HTML text at really large or really small sizes or in a color you never designed. Immedia removes all the vagaries so that what you see is what they get. But there's no free lunch; Immedia's Viewer and bandwidth requirements are enough to turn some Web developers away. Nonetheless, if you have the right audience, Immedia can be a great choice for creating an interactive Internet design. **m**

DAVID BLATNER is the author of *Real World QuarkImmedia* (Peachpit Press, 1997). You can reach him at david@moo.com.

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Macworld

Ghostly Movie Effects Come to Life

Merging Live Action with a "Painted" Background

by Cathy Abes

For some time, the Mac has been one of the stars of Hollywood's special-effects industry, and Available Light has been one of the many design studios providing those effects.

The studio created a number of digital effects for the Touchstone Pictures film *The Sixth Man*, about a star basketball player who dies and returns as a ghost to help his brother and the rest of the team win the championship. For one sequence, the artists used a combination of Adobe After Effects and Photoshop, the Photoshop plug-in collection Gallery Effects, and Avid Technology's Elastic Reality to give the illusion of the ghost's walking into, and becoming part of, a painting that's hanging on a wall.

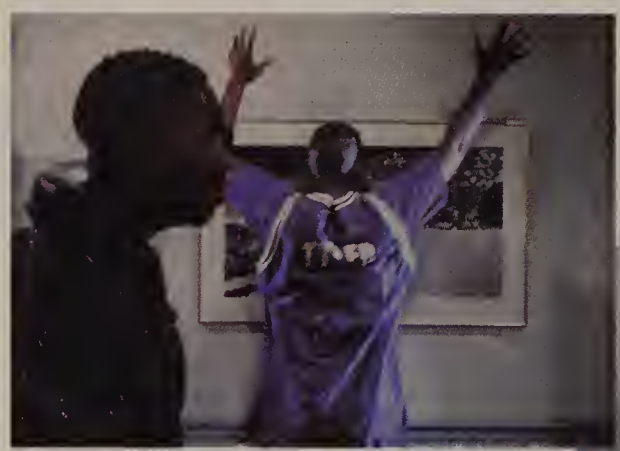
To suggest an otherworldly appearance for the ghost as he merges into the painting, the artists created a series of animated transitions—changing from liquefied to electrified to blurry, and increasingly transparent.

The "painting" that the ghost enters is actually one frame of a film clip, scanned into Photoshop, given a painterly look, and then output and photographed. Finally, a cross-dissolve transition changes the character from opaque to transparent and back to opaque again as he walks into the painting.

Available Light, based in Burbank, California, is a special-effects design studio whose work has appeared in many feature films, including *Stargate*, *The Arrival*, and *Who Framed Roger Rabbit*. As with all such projects, this one was a collaborative effort; this sequence involved John Van Vliet, effects supervisor; Laurel Klick, digital-effects supervisor; Steve Moore, on-set supervisor; Cynthia Hyland, digital artist; and Martin Hilke, digital rotoscoping artist. m

Senior Associate Editor CATHY ABES covers graphics for *Macworld* and is the author of *Photoshop F/X* (Ventana Press, 1994).

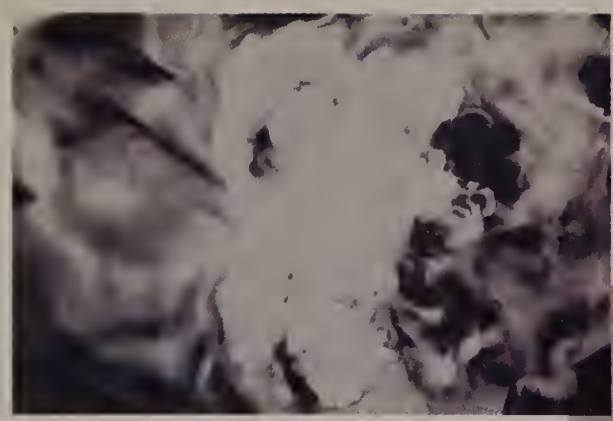
This Movie Magic Was Made on a Mac



1 The original live-action footage of Antoine (the ghost) and Kenny (his brother), for which Available Light gave visual input to the film's director as the scene was being filmed.

2 Articulate mattes—similar to masks—created in Elastic Reality (with a 2-pixel blur added in After Effects) enabled the artists to apply effects selectively to each character. By painting out Antoine and part of Kenny in Photoshop, the artists could apply other effects to just the background.

3 The location that appears in the painting was filmed with Antoine walking in front of a green screen. This enabled the artists to automatically generate masks of the moving character in After Effects—rather than draw a separate mask for each frame—to execute his transition into the painting.



4 Stock live footage of vapor escaping from dry ice, shot against black velvet, was scanned for use in conjunction with After Effects' Emboss filter to give the wall a liquid appearance. A single-frame matte masked the areas that were to stay unaffected: the painting, Kenny's shoulder, and the edges of the room.

5 Settings for the Emboss filter applied to the smoke were Direction, 16 degrees; Relief, 0 to 10; Contrast, 200; Blend With Original, 8 percent. The embossed vapor then became a displacement map for the background, with horizontal and vertical displacement set to Luminance; amount of horizontal displacement, 0 to 25; and amount of vertical displacement, between 0 and 5.

6 After isolating Antoine with an articulate matte, the artists applied Gallery Effects' Chrome filter, with the blue of his uniform as the foreground color and a darker shade of blue as the background color. They achieved a liquid look in After Effects by setting Blend With Original to 70 to 100 percent, Detail to 0, and Smoothness to 9. Then, using the articulate matte, they put the unaffected Kenny back in the scene as an overlay.

7 Using Photoshop's airbrush and smudge tools, the artists simulated electricity over Antoine's body, and then applied Photoshop's Lens Flare filter to create hot spots for a more dramatic electrified look.

8 For the final transition, Antoine received a Radial Blur in After Effects with Amount Of Blur set between 0 and 118. At the same time, the artists reduced his opacity, scaled him to a smaller size, and moved him toward the center of the painting to make him appear to walk into it.

9 A frame from the finished movie shows the completed composite of Kenny, Antoine, and the painting.

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CATHERS HUNTERS

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4.5 GB	(ST34572N)	$535	$595
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8ms Seek 512K Buffer 7200 RPM

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		INTERNAL	EXTERNAL
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4.5 GB Wide	(ST34501W)	$675	$755
9.1 GB	(ST19101N)	$995	$1055

7.9ms Seek 512K Buffer 10,000 RPM 5YR. Warr.

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4.5 GB	(Q34550)	$445	$505
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2072	MaxPowr	250/125/512K	7300-9600	$745
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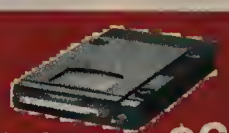

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APS Q 3000	Quantum Fireball ST, 3118MB, 5.4K	219.95	239.95	299.95	329.95
APS Q 4000	Quantum Fireball ST, 4110MB, 5.4K	249.95	269.95	329.95	359.95
APS Q 6400	Quantum Fireball ST, 6236MB, 5.4K	359.95	379.95	439.95	469.95
APS Q 8000	Quantum Fireball ST, 8191MB, 5.4K	479.95	499.95	569.95	599.95
APS Q 4500	Quantum Viking, 4345MB, 7200 rpm	289.95	309.95	N/A	399.95
APS ST 2000	Seagate Barracuda, 2157MB, 7200 rpm	329.95	349.95	N/A	449.95
APS ST 4300	Seagate Barracuda, 4340MB, 7200 rpm	479.95	499.95	N/A	599.95
APS ST 4500	Seagate Cheetah, 4348MB, 10,000 rpm	579.95	599.95	N/A	699.95
APS ST 9000	Seagate Barracuda, 8683MB, 7200 rpm	749.95	759.95	N/A	859.95
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APS I 9000 W	IBM Ultrastar 9ES, 8715GB, 7200 rpm	799.95	819.95	899.95	N/A
APS I 9100 W	IBM Ultrastar 9ZX, 8705GB, 10,000 rpm	999.95	1,019.95	1,099.95	N/A
APS I 18000 W	IBM Ultrastar 18XP, 17501GB, 7200 rpm	1,579.95	1,599.95	1,689.95	N/A
APS ST 23000	Seagate Elite 23, 22.1GB, 5400 rpm	N/A	N/A	N/A	$1,799.95
APS ST 23000 W	Seagate Elite 23, 22.1GB, 5400 rpm	N/A	N/A	N/A	1,899.95

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Model	Description	EL	Internal	Pro
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APS ST 2000 W	Seagate Barracuda, 2157MB, 7200 rpm	349.95	369.95	469.95
APS ST 4300 W	Seagate Barracuda, 4340MB, 7200 rpm	499.95	519.95	619.95
APS ST 4500 W	Seagate Cheetah, 4348MB, 10,000 rpm	609.95	619.95	719.95
APS ST 9000 W	Seagate Barracuda, 8683MB, 7200 rpm	769.95	789.95	889.95
APS ST 9100 W	Seagate Cheetah, 8681MB, 10,000 rpm	949.95	969.95	1,069.95

APS IDE DRIVES

Model	Description	Internal
APS Q 2000	Quantum Fireball ST, 2014MB, 5400 rpm	$145.95
APS Q 3000	Quantum Fireball ST, 3118MB, 5400 rpm	165.95
APS Q 4000	Quantum Fireball ST, 4136MB, 5400 rpm	199.95
APS Q 6400	Quantum Fireball ST, 6236MB, 5400 rpm	273.95
APS Q 8000	Quantum Fireball ST, 8063MB, 5400 rpm	318.95

APS POWERBOOK STORAGE

Model	Description	Internal
APS T 2000	Toshiba MK2103MAV, 2067MB, 4200 rpm IDE	$299.95
APS T 810	Toshiba MK1926FBV, 810MB, 4000 rpm SCSI	449.95

APS REMOVABLE DRIVES

Model	Description	SR 2000	Pro
APS SQ 5200	SyQuest 5200, 190MB	$389.95	N/A
APS Jaz	(with 1 cartridge) 1GB	299.95	$349.95
APS Jaz II	(with 1 cartridge) 2GB	499.95	499.95

APS MO DRIVES

Model	Description	SR 1000	SR 2000	Pro
APS 640 MO	Fujitsu M2513A2#N	N/A	399.95	$429.95
APS 2.6GB MO	Sony SMO-F544, 2.4GB	N/A	1,669.95	N/A
APS 5.2GB MO	Sony SMO-F551, 5.2GB	N/A	N/A	1,869.95

APS CD-ROM/CD-R/CD-RW DRIVES & MASTERING SYSTEMS

Model	Description	External
APS CD24	24X CD-ROM in Slimline Case	$129.95‡
APS CD32	32X CD-ROM in Slimline Case	159.95‡
APS CD Changer	Nakamichi 5 Disc/16X CD-ROM, Pro Case only	299.95
APS CD-R 4X8	4X record/8X read CD-R in Pro Enclosure	449.95
APS CD-R Pro	4X record/6X read CD-R in Pro Enclosure	529.95
APS CD-RW	2X record/6X read CD-RW in Pro Enclosure	529.95
APS CD-RW Pro	4X record/6X read/2X rewrite CD-RW, Pro Enclosure	599.95
APS Jaz/CD-R System	2X record/6X read CD-R, Pro Enclosures	799.95
APS 2GB/CD-RW Sys.	Q 2000 Hard Drive & 2X record/6X read CD-RW, Full Height Enclosure	999.95

‡Available in an SR 2000 Enclosure for an additional $50.00

APS TAPE BACKUP SYSTEMS

Model	Description	Internal	External
APS HyperQIC®	Travan 4 Conner QIC 3095, 8GB	$299.95	$349.95
APS HyperDAT®	DDS-2DC, 8GB	549.95	599.95
APS HyperDAT® Pro	DDS-2DC, 8GB	749.95	849.95
APS HyperDAT® III	DDS-3DC, 24GB	1,049.95	1,099.95
APS Mini Library	4mm DDS-2 AutoLoader, 64GB	N/A	2,399.95
APS DLT30	DLT 3000, 30GB	N/A	2,499.95
APS DLT40	DLT 4000, 40GB	N/A	2,899.95
APS DLT70	DLT 7000, 70GB	N/A	6,899.95
APS AIT*	8mm W/DC, 50GB	N/A	2,899.95
APS DL1	4MM DDS-2 Autoloader, 136GB Now Even Faster!	N/A	4,999.95

*See Adaptec PowerDomain 2940 Ultra Wide SCSI Host Adapter offer to gain maximum throughput.
Call for information about Windows '95 and Windows NT versions of these great drive products

Prices in Red are Hot Deals! Order online @ http://www.apstech.com

High Performance 7200 RPM 4GB Drive!

$289.95*

Best 4Gb 7200 rpm deal anywhere!

- Speed up your desktop
- Quantum Viking mechanism
- Perfect replacement/upgrade for desktops and workstations
- 7200 rpm performance for 5400 rpm price

APS Q 4400 Quantum Viking, 4345MB **EL $289.95** APS Pro **$399.95**

The APS EL (Economy Line) drives are intended as replacements or upgrades for your current internal hard disk. They do not include brackets, cables or screws. Please keep your invoice for warranty purposes.

APS JAZ II

$499.95

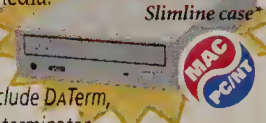
- Huge 2GB capacity
- Reads and writes 1GB Jaz disks
- Includes cartridge

APS Pro Enclosure

APS CD24

$129.95 *Slimline case**

- 24X for fluid multimedia!
- Easy tray loading eliminates caddies



*Slimline case does not include DaTerm, but does come with block terminator.

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APS HYPERQIC®

- Backup up to 8GB* on one standard TR-4/QIC cartridge
- Field-proven desktop backup reliability

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APS Pro Enclosure

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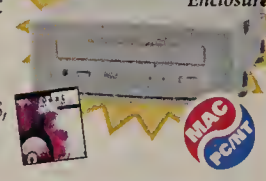

$819.95 *Internal configuration*

Shown in APS Pro Enclosure

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- 10,000 rpm 9.1GB drive for top-performance workstations
- 6.3 ms average seek time for OLTP and OLAP

APS ST 4500 W $609.95

EL configuration

- Ultimate drive for 3D, CAD and DV pros
- 10,000 rpm Cheetah

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- Refused orders subject to 20% restocking fee.
- International customers must pay for all shipping charges.
- Listed capacities are formatted.
- Actual data compression and tape capacity vary greatly depending on the type of data recorded, other system parameters and environment.
- Prices and specifications are subject to change without notice.
- You must install system software appropriate to your machine before using our hard drives.
- Not responsible for typographical errors.
- Your APS Drive unit may contain one or more components that were in prior use, but which have been inspected and repaired or rebuilt as necessary. These components, if any are covered by the same warranty provisions, exclusions and limitations to the same extent, and on the same terms as otherwise "new" components.
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APS Technologies

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3228MB	5400rpm	512K	FB33200S	3yr	$239	$299
4310MB	5400rpm	512K	FB34300S	3yr	$275	$335
6448MB	5400rpm	512K	FB36400S	3yr	$355	$415
8455MB	5400rpm	512K	FB38400S	3yr	$455	$515
9100MB	7200rpm	1024K	XP309100S	5yr	$799	$849
18200MB	7200rpm	1024K	XP318200S	5yr	$1299	$1359
ULTRA WIDE SCSI						
2275MB	7200rpm	512K	XP32275W	5yr	$189	$279
4550MB	7200rpm	512K	VK304550W	5yr	$439	$529
9100MB	7200rpm	512K	VK309100W	5yr	$649	$739
ULTRA-2 SCSI						
4550MB	7200rpm	512K	VK304550LW	5yr	$439	$569
9100MB	7200rpm	512K	VK309100LW	5yr	$649	$779
9100MB	7200rpm	1024K	XP309100LW	5yr	$799	$929
18200MB	7200rpm	1024K	XP318200LW	5yr	$1289	$1419
Ultra IDE						
2111MB	5400rpm	512K	FB32100A	3yr	$145	
3228MB	5400rpm	512K	FB33200A	3yr	$157	
4310MB	5400rpm	512K	FB34300A	3yr	$177	
6448MB	5400rpm	512K	FB36400A	3yr	$258	
8455MB	5400rpm	512K	FB38400A	3yr	$322	

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- ✓ Toast Mastering Software
- ✓ 5 FREE disks
- ✓ Toll Free support

4x8 CDR $399

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CD RECORDABLE Includes 5 Free Recordable Disks!	External	Duo
2x6 Sony mechanism, caddy load, 1MB buffer	$369	$669
4x6 Yamaha mechanism, tray load, 2MB buffer	$499	$799
4x8 Matsushita (Panasonic) mechanism, tray load, 1MB buffer	$399	$699
4x8 Sony mechanism, caddy load, 2MB buffer	$429	$729
4x12 Teac mechanism, tray load, 1MB buffer	$479	$779
4x12 Plextor mechanism, caddy/tray load, 1MB buffer	$579	$879
CD REWRITABLE Includes 5 Free ReWritable Disks!		
2x6 Philips mechanism, tray load, 1MB buffer	$419	n/a
2x6 Ricoh mechanism, tray load, 1MB buffer	$469	$769
2x6 Ricoh mechanism, caddy load, 2MB buffer	$519	$819
2x4x6 Yamaha mechanism, tray load, 2MB buffer	$589	$889

Duo Master is one of the most innovative CD mastering solutions available. 1GB Jaz or Syjet drive and CDR in one unit. Create your master on the Jaz or Syjet cartridge drive and then master directly to the CD. This is the perfect CD mastering setup! Includes 5 free CD-R (CD-RW with CD-RW drive) and 1 free cartridge.

• SCSI HARD DRIVES •

Seagate

4550MB	7200rpm	512K	ST34555N	3yr	$289	$349
4550MB	7200rpm	512K	ST34573N	5yr	$539	$599
4550MB	10,000rpm	512K	ST34501N	5yr	$549	$609
9100MB	10,000rpm	512K	ST19101N	5yr	$929	$989
9190MB	7200rpm	1024K	ST39173N	5yr	$779	$839
18200MB	7200rpm	1024K	ST118273N	5yr	$1499	$1559
23200MB	5400rpm	512K	ST423451N	5yr	$1369	$1469
ULTRA WIDE SCSI						
4550MB	7200rpm	1024K	ST34573W	5yr	$539	$629
4550MB	10,000rpm	512K	ST34501W	5yr	$589	$679
9100MB	10,000rpm	512K	ST19101W	5yr	$929	$1009
9190MB	7200rpm	1024K	ST39173W	5yr	$799	$889
18200MB	7200rpm	1024K	ST118273W	5yr	$1499	$1589
23200MB	5400rpm	512K	ST423451W	5yr	$1299	$1399
ULTRA-2 SCSI						
4550MB	7200rpm	1024K	ST34573LW	5yr	$569	$789
4550MB	10,000rpm	1024K	ST34502LW	5yr	$779	$909
9100MB	10,000rpm	1024K	ST39102LW	5yr	$1069	$1199
9190MB	7200rpm	1024K	ST39173LW	5yr	$819	$949
18200MB	7200rpm	1024K	ST118273LW	5yr	$1499	$1629
18200MB	10,000rpm	1024K	ST118202LW	5yr	$1859	$1989

IBM

4550MB	5400rpm	512K	IBM34330N	5yr	$289	$349
18200MB	7200rpm	1MB	IDGHS18Z	5yr	$1409	$1469
ULTRA WIDE SCSI						
4550MB	5400rpm	512K	IBM34330W	5yr	$289	$379
9100MB	10,020rpm	1MB	IDVGS9U	5yr	$989	$1079
18200MB	7200rpm	1MB	IDGHS18U	5yr	$1409	$1499

WESTERN DIGITAL

2100MB	7200rpm	512K	WDE2170N	5yr	$319	$379
4300MB	7200rpm	512K	WDE4360N	5yr	$459	$529
9100MB	7200rpm	512K	WDE9100N	5yr	$699	$759
ULTRA WIDE SCSI						
2100MB	7200rpm	512K	WDE2170W	5yr	$319	$409
4300MB	7200rpm	512K	WDE4360W	5yr	$459	$549
9100MB	7200rpm	512K	WDE9100W	5yr	$699	$789

FUJITSU

ULTRA WIDE SCSI						
4550MB	7200rpm	512K	M3045W	5yr	$385	$485
9100MB	7200rpm	512K	M3091W	5yr	$659	$759
18200MB	7200rpm	512K	M3182SW	5yr	$1239	$1339

We have great prices on Iomega and Syquest. Call or see our Web site.

Tech Note: Ultra 2 SCSI
Features up to 80MB/s transfer when used with an Ultra 2 SCSI controller. Note - We use the right components for our external Ultra-2 drives. If you see a competitor selling external Ultra-2 drives for less than $100 more than an internal, they are probably just using ultra wide components which will cause many problems!

• SALE ITEMS •

IBM

Check out these great prices! **9GIG $589**

SCSI					Int	Ext
4550MB	7200rpm	512K	IBM34560N	5yr	$339	$399
9100MB	7200rpm	512K	IBM39130N	5yr	$589	$649
Ultra Wide SCSI						
4550MB	7200rpm	512K	IBM34560W	5yr	$345	$435
9100MB	7200rpm	512K	IBM39130W	5yr	$599	$689

WOW CD Media Sale

100 CDR-74 (with Jewel Case) **$109**

100 CDRW-74 (with Jewel Case) **$999**

Sale good 5/25/98-6/26/98

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Compatible with MAC or PC

Bare card	ATTOPCIU2	$469
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HP 4mm	2-4GB	42MB/min	C1536XM	$689
Seagate TR4	4GB	30MB/min	STT28000XM	$409
Seagate TR4	4-8GB	60MB/min	STT28000CXM	$539
Sony 4mm	4-8GB	44MB/min	SDT5000XM	$679
Sony 4mm	4-8GB	90MB/min	SDT7000XM	$679
Seagate 4mm	4-8GB	60MB/min	STD28000XM	$829
HP 4mm	4-8GB	60MB/min	C1599XM	$819
Exabyte 8mm	7-14GB	60MB/min	EXB8700LTXM	$719
Exabyte 8mm	7-14GB	120MB/min	ELIANTXM	$1449
Sony 4mm	12-24GB	144MB/min	SDT9000XM	$999
Seagate 4mm	12-24GB	120MB/min	STD224000XM	$1089
HP 4mm	12-24GB	120MB/min	C1554XM	$1139
Quantum DLT	15-30GB	150MB/min	DLT2000XTXM	$2449
Exabyte 8mm	20-40GB	360MB/min	EXB8900XM	$3549
Quantum DLT	20-40GB	180MB/min	DLT4000XM	$2729
Seagate AIT	25-50GB	360MB/min	STA150000XM	$2999
Sony 4mm	32-64GB	90MB/min	TSL7000XM	$1949
Quantum DLT	35-70GB	600MB/min	DLT7000XM	$5799
Seagate 4mm	48-96GB	120MB/min	STL496000XM	$2419
Exabyte 8mm	70-140GB	60MB/min	EXB10HM	$3949
HP 4mm	72-144GB	120MB/min	C5648XM	$2699
Quantum DLT	75-150GB	150MB/min	DLT2500XTM	$4429
Quantum DLT	100-200GB	180MB/min	DLT4500M	$5549
Seagate AIT	100-200GB	360MB/min	STL420000M	$Call
Quantum DLT	105-210GB	150MB/min	DLT2700XTM	$6099
Quantum DLT	140-180GB	150MB/min	DLT4700M	$7419

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20 Pack	$42/$39	$340/$335	$65/$62
50 Pack	$93/$89	$799/$789	$139/$135
100 Pack	$175/$169	$1500/$1480	$259/$249
Budget 5 Pack	$19/$17	$80/$76	$24/$21
Budget 20 Pack	$36/$33	$299/$289	$55/$52
Budget 50 Pack	$74/$70	$699/$689	$119/$109
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CDR74 is recordable, CDR74W is rewritable, CDR74P is printable. Price is alone/with CDR purchase.

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These CD ROM drives are the best in the industry. Price is bare drive/external with software.

				Bare	Ext
NEC	CDR1610XM16X	100ms	256K	$89	$149
Nakamichi	MJS16XM16X	130ms	5 Disk Changer	$199	$259
NEC	CDR1810XM24X	85ms	128K	$99	$159
Pioneer	DRX32SXM32X	70ms	128K	$105	$165
Toshiba	XM6201BXM32X	85ms	128K	$105	$165
Plextor	PX32TSXM32X	85ms	512K	$215	$275

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ADAPTEC CONTROLLERS		
PCI Wide Single Channel	A2940MUW	$269
PCI Wide Dual Channel	A3940MUW	$489
PCI FireWire + Wide SCSI	AHA8945	$639

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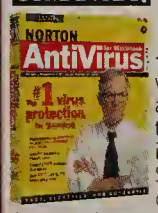

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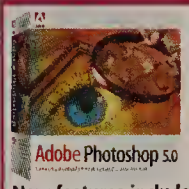

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macromedia

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AM = active-matrix display
DS = dual-scan display

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3Com

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PalmPilot Professional 287.36
PalmPilot III 387.46

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DJ800 19" (18" view) 0.26mm 699.83
DJ920 21" (19.9" view) 0.28mm 1029.55

MONITORS

PHILIPS MAGNAVOX

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107S 17" (16.2" view) 0.28mm 347.30
109S 19" (17.9" view) 0.26mm 687.59

NEC

A500 15" (13.8" view) 0.28mm 269.61
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A700 17" (15.6" view) 0.28mm 477.63
E700 17" (15.6" view) 0.25mm 566.33
P750 17" (15.6" view) 0.25mm 755.46
E1100 21" (19.8" view) 0.28mm 1059.80
P1150 21" (19.6" view) 0.28mm 1188.57

SONY

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G800 20" (18.4" view) 0.28mm 939.89
G810 21" (20" view) 0.25mm 1025.12
P775 17" (16" view) 0.25mm 494.53
PT775 17" (16" view) 0.25mm 666.46
P810 21" (20" view) 0.25mm 1128.32
PT813 21" (20" view) 0.28mm 1316.75
P815 21" (20" view) 0.25mm 1237.87

VIDEO BOARDS

ATI

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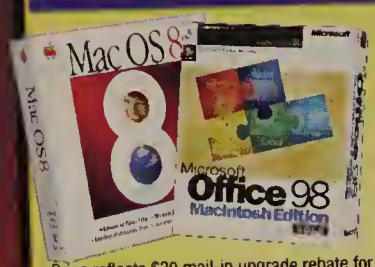

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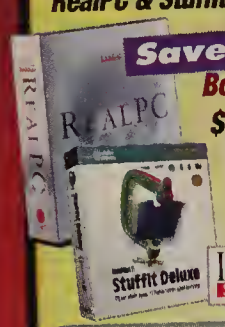

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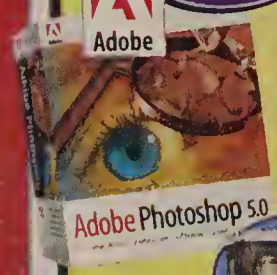

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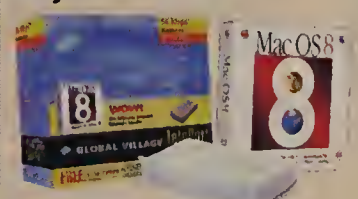

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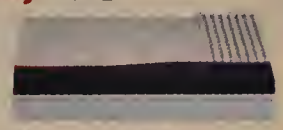

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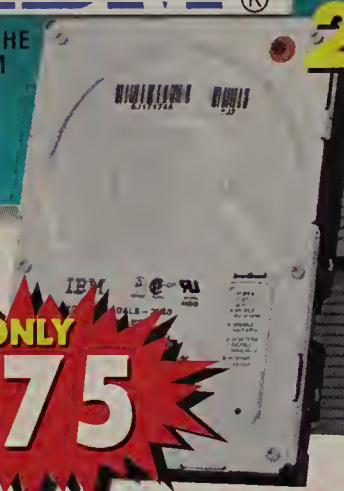

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18.2GB	Atlas III	QM318200TDS	7.8ms	7200	$1379	$1399	$1449
UltraWide SCSI-3							
4.5GB	Viking II	QM304550PXSW	7.5ms	7200	$449	$479	$559
9.1GB	Atlas III	QM309100TDLW	7.8ms	7200	$869	$899	$979
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18.2GB	Barracuda 18	ST118273N	7.1ms	7200	$1479	$1499	$1549
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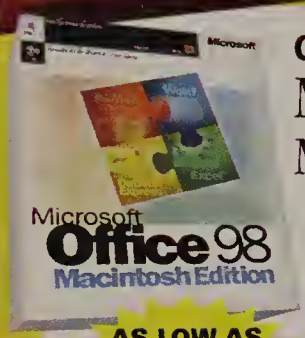

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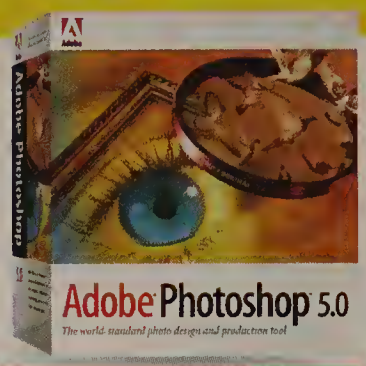

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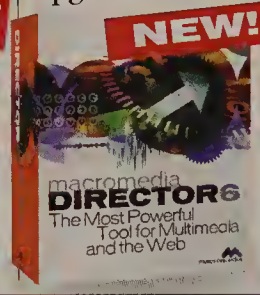

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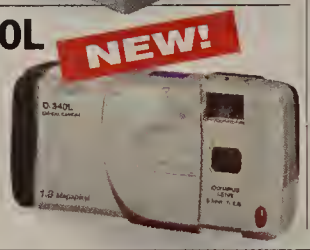

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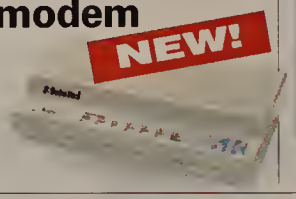

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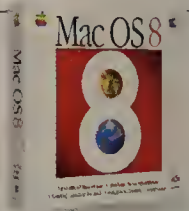

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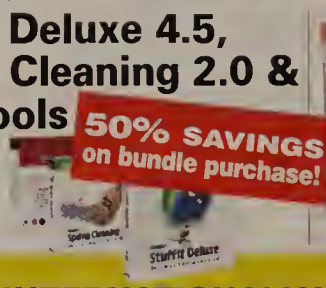

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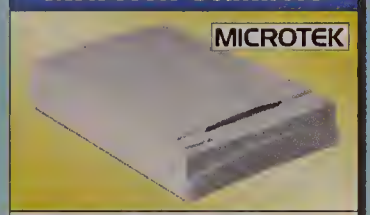

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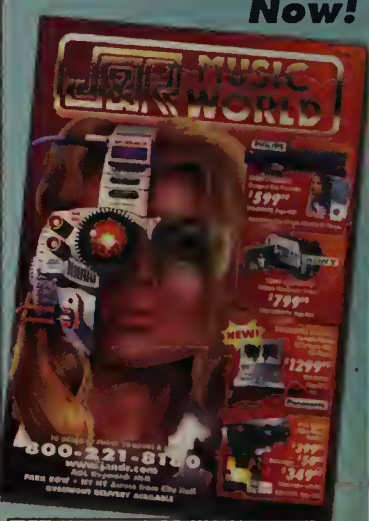

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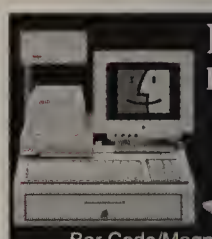

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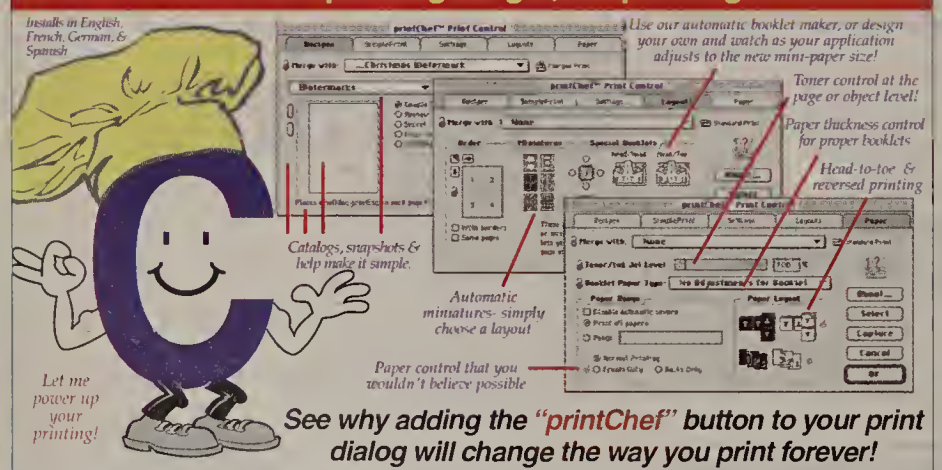

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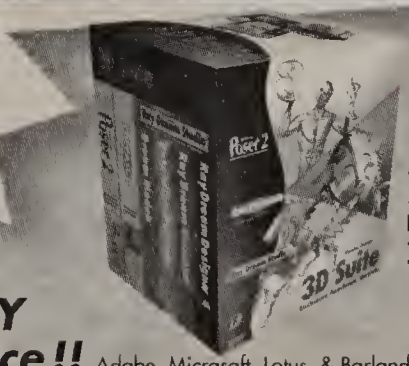

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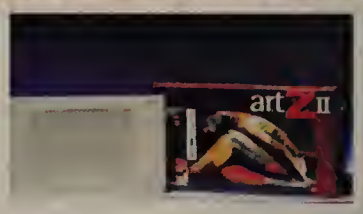

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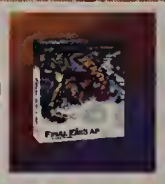

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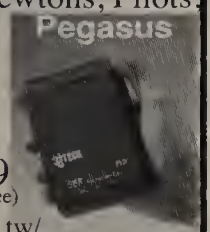

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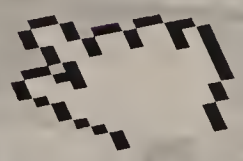

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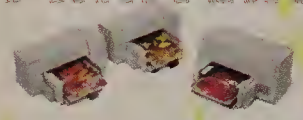

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Epson Color Stylus 600	249
Epson Color Stylus 700	269
Epson Color Stylus 800	289
Epson Stylus Photo EX	485
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Epson Color Stylus Pro XL	1389
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G3/233/32MB/4G/20x/E-net	3041
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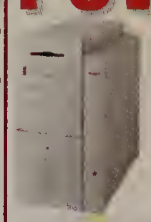

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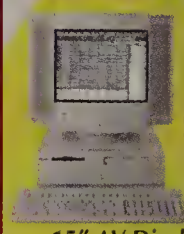

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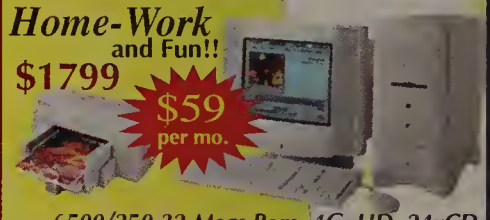

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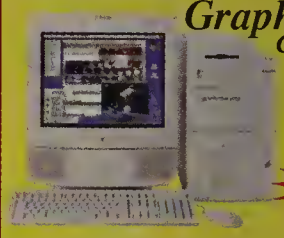

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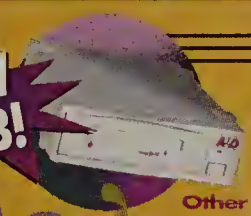

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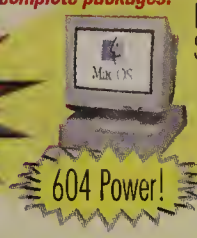

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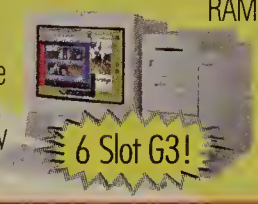

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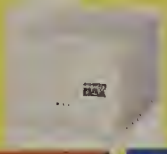

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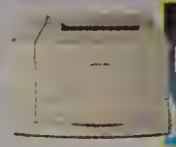

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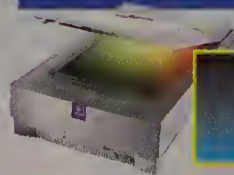

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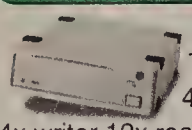

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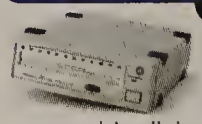

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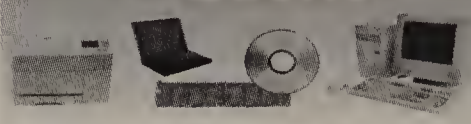

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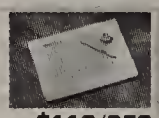

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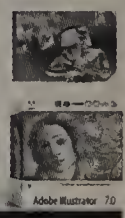

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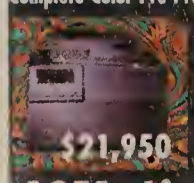

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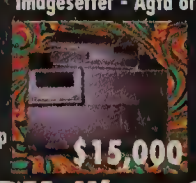

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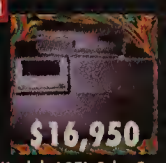

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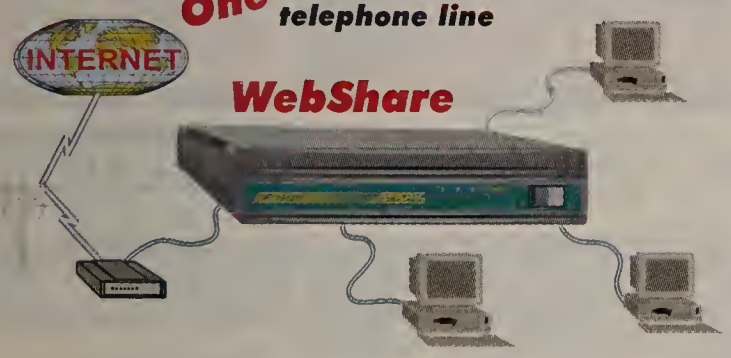

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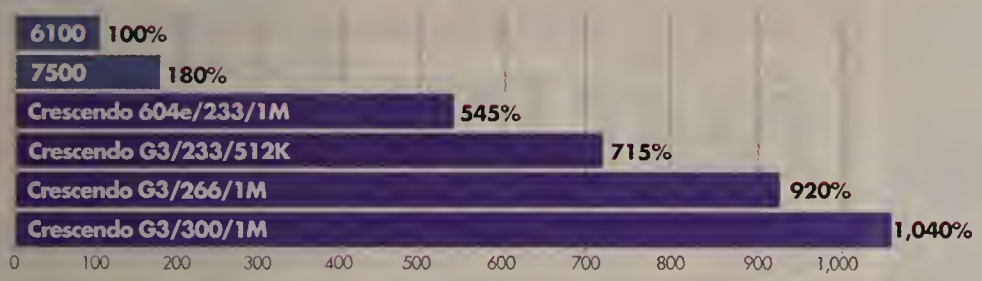

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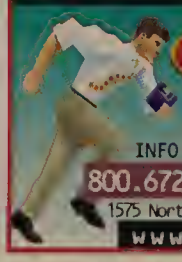

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Steve Jobs, Razor Blade

HE'S SHARP, STEELY, AND DIRECT—MAYBE TOO MUCH SO

DON'T SEAT GIL AMELIO next to Steve Jobs at your next dinner party. Jobs is "manic" and "erratic," Amelio writes in his new book, *On the Firing Line: My 500 Days at Apple Computer.* Jobs takes "credit for achievements that had all been initiated long before he took over," and he arbitrarily terminates projects and people. He makes decisions that wound the Macintosh faithful. And he carries around an IBM ThinkPad.

All right, so Steve isn't Snuggles the Fabric Softener Bear. But admit this much: in his first sixth months as temporary monarch, he pulled Apple back from the brink of death. He understands the reason behind Apple's three-year decline, something that nobody else seems to get. It's not technology, Microsoft, or even market share—it's *profit.*

When a company loses money, the Great Popular-Opinion Cycle begins. Wall Street gets nervous; analysts worry; and the public, already terrified about computer obsolescence, stops buying Macs. Profits go down, and the cycle begins again.

The Turnaround Artist

Everything Jobs has done has been directly tied to reversing that death spiral. Every action was designed to (a) make money and (b) reassure the public. The Newton was beloved—but only by 200,000 people. The clones were sucking away profit. Free tech support was great, but it put Apple at a disadvantage. Canceling these programs involved brutal, unpopular decisions. But sometimes you've got to amputate the arm to save the patient.

Phase II of the Jobs master plan—reassuring the public—is also working. Pre-Jobs, where did consumers get their impression of Macs? From the pathetic, broken-down Performas in CompUSA. From the Siberia of the back shelves at Best Buy.

So Jobs told the computer stores: "If you aren't going to make the Mac look good, we don't want you." He made CompUSA the exclusive Mac dealer chain—in exchange for a classy presentation in each store. Recognizing that nobody can out-market Microsoft, Jobs struck up a deal that helps both companies, puts Microsoft publicly on Apple's team, and brought us the first decent version of Microsoft Office in years.

And then he got busy on TV. His first task was encouraging existing Mac users to revel in owning the minority computer—thus the "Think Different" ads. Never mind that Mr. and Mrs. Technophobe never even saw a picture of a Mac. This ad wasn't for them. It was for us.

The follow-up ads were better yet. Jobs, along with ad agency Chiat/Day, neatly leveraged Intel's years of advertising into service for Apple. The first commercial, in which a snail crawls by with a Pentium II chip on its back, is funny, bold, and unforgettable. "OK, fine," it seems to say, "if you think the processor is so important, ours is twice as fast." The following ad brilliantly spoofed TV's most overexposed, incomprehensible, and annoying characters: the dancing Intel "bunnies" in neon-colored radiation suits.

And so, at last, the Apple death cycle has slowed. Apple is making money, the stock price has doubled, several companies have canceled their Mac phaseouts. Under the direction of coolness-oriented Jobs, Apple product designs are once again sexy and irresistible (that flat-panel monitor—yum!). And, incredibly, a few "Apple comeback" articles have started appearing, like daffodils poking through the snow.

Cutting Too Deep

So it's Steve Jobs for President, right? I mean, sure, Steve sometimes storms out of TV interviews, micromanages rank-and-file employees, and parks in the handicap spaces at Apple. But to turn a company around you need someone as sharp, quick, and fast as a razor blade. A few nicks come with the territory.

But then we hear about another terrific engineer leaving Apple, driven out by its tyrannical leader. Or we hear about somebody who never even made it past Steve's snap judgments, like the woman whose job interview is described at Upside.com. "I've never met one of you [Human Resources people] who didn't suck," Jobs told her.

Brains and talent are Apple's lifeblood, and not even incisive management can replace them. Dear Dr. Steve: We love the way your magic scalpel is sculpting Apple into a beautiful company again—but watch out for the arteries. **m**

DAVID POGUE (www.pogueman.com) is the author of *PalmPilot: The Ultimate Guide* (O'Reilly & Associates, 1998).

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